

Accelerating

corporate

procurement of

RENEWABLE ENERGY IN INDIA



Content

Executive summary	4
Introduction	5
Forewords	7
1. Corporate renewable energy procurement	9
2. Options for corporate renewable procurement	12
3. Key terms of PPAs	17
4. The regulatory landscape	22
5. Challenges	28
6. Financing corporate renewable PPA projects	32
7. Expected market developments	35
8. Recommendations for corporate buyers	38
9. Case Studies	40
Glossary	48
Relevant business focused initiatives in India	49
Acknowledgements	50

This report is supported by six case studies of corporate renewable energy procurement in India. The case studies are presented in Chapter 9.

1: Idea's success story in renewable energy telecom towers: Zero to 12 MW in four years - Idea Cellular Ltd.

2: Powering Godrej Industries with renewables - Godrej Industries

3: Connecting aspirations towards RE100 - Tata Motors

4: UltraTech's strategic procurement of renewable electricity - Ultratech

5: Kreate Energy's renewable power solutions: integrated corporate power procurement strategies - Kreate

6: Dilli Haat achieves 98% reliance on solar power - CleanMax Solar



Executive summary

Purchasing renewable electricity is becoming more attractive for companies across the world. In India, increasing grid power tariffs for commercial and industrial consumers, falling prices for renewable projects and renewable energy's contributions to sustainability commitments have led to companies actively procuring renewable power for their operations.

One option for companies to buy renewable power is to use corporate renewable Power Purchase Agreements (PPAs). A PPA is a contract between a power buyer and a power producer to purchase electricity at a pre-agreed price for a pre-agreed period of time.

Corporate renewable PPAs help companies reduce current electricity costs, increase visibility over future electricity costs, while supporting a company's CO₂ or renewable targets. Power producers use them to diversify investments in renewable projects, enhance bankability and reach new customers.

On a stand-alone basis, renewable power is now economically viable in most parts of India. However, renewable projects require access to the grid, which is regulated and can have charges associated with it. Power sector regulations in India were originally designed with utility scale thermal power plants in mind, but there have been changes in recent years to accommodate an increasing share of renewable power.

These changes are still in progress. As a result, some Indian states are further ahead in support and integration of renewables than others. State level support - or lack thereof - impacts the ease of adoption and viability of projects built for commercial and industrial consumers.

Corporate renewable PPAs in India have developed significantly over the past year and corporate buyers and power producers as well as intermediaries are working to standardize contracts. Commonly used terms will enable counterparties to faster agree on the commercial, legal and operational aspects of the project.

Supply-demand dynamics make corporate renewable PPAs a buyer's market. To ensure reliability and availability of power as per contracted terms, companies should carefully choose the developer of their corporate renewable PPA considering their experience in executing quality projects, assessing their long-term interest in operating power plants and judging their financial strength to build and operate these plants.

This report discusses options for renewable power procurement in India and examines key terms of PPAs, regulatory landscape and market barriers. It also delves into financing options and concludes with recommendations for corporate buyers.

This report is meant to be an important resource for companies considering corporate renewable PPAs in India.

Introduction

The World Business Council for Sustainable Development (WBCSD) works to accelerate the transition to a sustainable world. At COP21 in 2015, WBCSD member companies highlighted the potential that renewable energy has for keeping global warming to well below 2°C. In doing so, they demonstrated the critical role that the private sector was ready to play in scaling up renewable energy deployment.

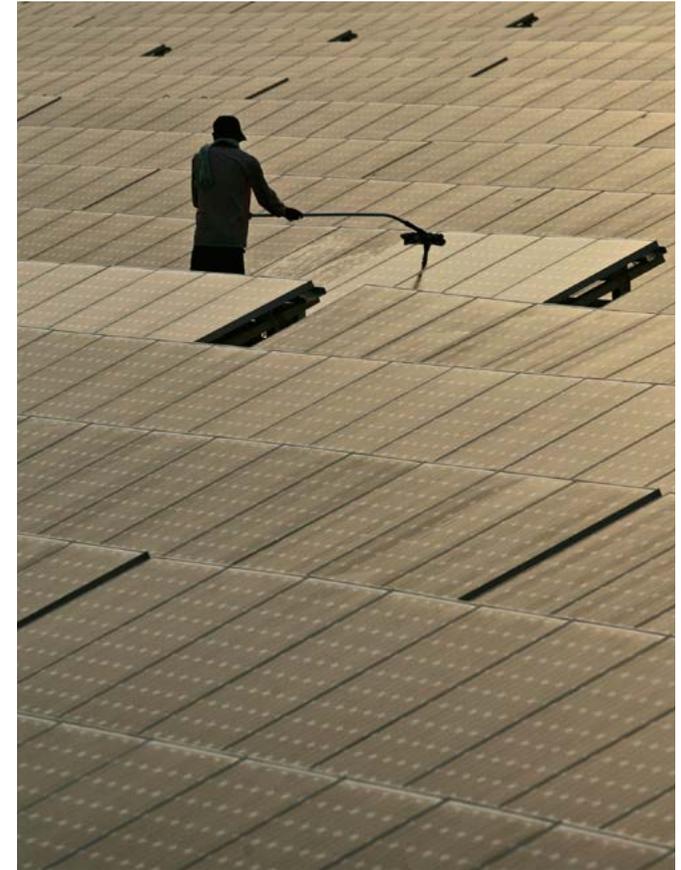
Since then, WBCSD members have been working to accelerate deployment of renewable energy beyond average market growth through our project [REscale](#). Specifically, through corporate renewable Power Purchase Agreements (PPAs).

Corporate renewable PPAs are an important instrument for accelerating renewable energy deployment. A PPA is a contract between the corporate buyer and the power producer (developer, independent power producer, investor) to purchase electricity at a pre-agreed price for a pre-agreed period of time. The contract contains the commercial terms of the electricity sale: contract length, point of delivery, delivery date/times, volume, price and product. The electricity sold under a PPA can be from an existing renewable energy supply or a newly built project.

Corporate renewable PPAs help companies reduce current electricity costs and increase visibility over future electricity costs, while supporting a company's CO₂ or renewable targets. Power producers use them to diversify investments in renewable projects, enhance bankability and reach new customers.

WBCSD members identified India as an important geography for advancing the understanding and use of corporate renewable PPAs because it is a large electricity market with dynamic growth and a regulatory environment that varies across its 28 states.

A significant bulk of India's power generation capacity is yet to be built and a large part of the new electricity demand is expected to come from businesses. In 2014-15, industrial and commercial electricity consumption accounted for more than 50 percent of total demand (948 TWh)¹. The compound annual growth rate of the industrial and commercial sector's electricity demand has been 10.7 percent and 8.1 percent, respectively between 2005-06 and 2014-15. It now makes economic sense for companies to satisfy their additional electricity demand from renewable sources, and establishing renewable electricity purchasing will be an integral part of their business strategy: Solar and onshore wind are today cheaper than electricity grid tariffs in most states across the country.



¹ Ministry of Statistics and Programme Implementation, Energy Statistics, 2016.

WBCSD members spent 18 months exchanging practical knowledge on how they are implementing corporate renewable PPAs in India, covering both off-site and on-site installations. This knowledge has been combined with research on the regulatory and market environment to produce this report.

This report sets out the current level of renewable energy procurement by companies in India, and dives into the various options available. It explains key terms of PPAs which corporate buyers and developers negotiate on and describes the current regulatory environment both parties operate in, and how this is forecasted to change. The report also reviews experienced challenges and provides an overview of the different financing options for PPAs.

It concludes with recommendations for corporate buyers and brings these to life with several case studies. Altogether, the report aims to increase the understanding of corporate renewable PPAs amongst all stakeholders.

This report is designed for procurement departments within renewable energy buyers, heads of origination and business development within project developers as well as regulators and government officials in India who would like to increase their understanding of corporate renewable PPAs. The executive summary at the start of this report is a good resource for sustainability personnel and decision-makers to get the conversation started.

This report on corporate renewable PPAs in India can be read in conjunction with WBCSD's suite of resources on PPAs including:

- The report on "[Corporate Renewable Power Purchase Agreements – Scaling up globally](#)" highlighting the benefits of corporate renewable PPAs as a critical component of improving bankability and presenting recommendations to overcome challenges faced by corporate buyers and developers;
- [A guide on accounting options for corporate PPAs](#) explaining how companies can account for PPAs under the International Financial Reporting Standards; and
- The report on "[Innovation in PPA structures](#)" helping companies overcome challenges and set up innovative, successful renewable PPAs.



Foreword

South Asia is considered the world's fastest growing region with seven percent GDP growth in 2015, led by India. Although the region comprises three percent of the world's land area, it is home to more than 23 percent of the world's population and at least 14 percent of its urban population. The region is particularly vulnerable to climate change because of its large population and vast low-altitude agricultural and economic activities. In India and Bangladesh alone, opportunities for climate-smart investing outlined in the countries' Nationally Determined Contributions (NDCs) total an estimated USD \$2.2 trillion by 2030.

India has witnessed significant growth of installed domestic renewable energy in the past years, but the country will need to continue to scale up its success with renewable energy in order to fuel continued sustainable economic growth while meeting the targets committed to under the Paris Agreement. The International Finance Corporation (IFC), the largest global development institution focused on the private sector, has partnered with companies, developers and financial institutions to develop and mobilize private sector financing for renewable energy in India.

As part of this effort, IFC is happy to provide our support for this report, which thoroughly examines a key aspect in scaling renewable energy in India even further: the topic of Corporate Renewable Power Purchase Agreements (PPAs). This report reflects the updated details on a previous IFC work related to assessment of parity driven solar PV market in India. The right use of PPA mechanisms can enable companies – from small and medium enterprises to major energy-intensive corporations – to improve their competitiveness and sustainability by purchasing cost-effective renewable energy. PPAs in India have proven to be successful thus far with 1.8 GW of solar PPAs in place by the end of 2017, but challenges remain in further increasing such efforts. This report offers recommendations on how to unlock the potential of corporate PPA in the commercial and industrial sector, which accounts for nearly half of total electricity consumption in India or 533 TWh as of the end of FY 2017².

IFC stands as a dedicated partner, advisor and investor, to enable more solar deployment with the promising tool of corporate renewable PPAs. In the past five years, IFC has invested approximately USD \$1.3 billion in long-term financing and mobilized an additional USD \$730 million, for a total of over USD \$2 billion in climate-related investments in India.

IFC is committed to mobilizing additional investments and bringing our expertise to creating markets and new opportunities in this growing sector, and see that this report as an important tool that can help unlock the potential of corporate renewable PPAs.



Milagros Rivas Saiz,
Manager, Cross-Industry
Advisory, International
Finance Corporation

² Ministry of Power, Central Electricity Authority, Growth of electricity sector In India from 1947-2017. http://www.cea.nic.in/reports/others/planning/pdm/growth_2017.pdf

Foreword

In 2015, the world's leaders set an ambitious vision with the Paris Agreement and the Sustainable Development Goals, committing us all to achieve close to zero emissions and zero poverty target in less than a generation (generation is 25 years).

India's renewable energy ambition of 175 GW is an important element for the success of this global vision as it has significant impact on the overall global emissions trajectory and it also inspires other countries to step up their climate action.

Renewable energy is expected to help India in meeting its Paris commitments, creating jobs and increasing social-economic development. We expect the government and the private sector to continue their focus on renewable energy in India.

Corporate renewable PPAs are one of the most important ways in which companies can reap the benefits of renewable energy. The cost of electricity from solar rooftop projects is now significantly lower than utility tariffs in most states, making it a "must have" from an economic attractiveness perspective for industrial and commercial entities. Similarly, thanks to Open Access regulations, sourcing power from wind and solar farms located far from consumption points is also possible.

However, each of these transaction modes need to be evaluated to meet business need and risk appetite. This report, prepared by the members of the World Business Council for Sustainable Development, shares the knowledge of the India PPA market, based on experience from leading companies - both corporate buyers and sellers of renewable energy and I hope will help guide your company in its journey to 100 percent renewable energy.



A handwritten signature in blue ink, appearing to read 'Rajiv Ranjan Mishra', with a horizontal line underneath.

Rajiv Ranjan Mishra,
Managing Director,
CLP India

1. Corporate renewable energy procurement



Companies active in India are increasingly looking to reduce their environmental footprint and energy costs.

While reducing energy consumption is often the most obvious way to reduce climate impact, companies need to maintain continuous business operations, and energy is critical for this. As a result, many private companies are procuring energy from renewable generation sources as part of their plans to reduce carbon emissions in their sustainability strategy.

There are several options for companies to adopt a renewable energy strategy, for instance through renewable electricity, heat or transport - all of which have benefits. The most accessible solutions in terms of carbon emission reduction for many industries are currently centered around renewable electricity.

Most companies in India buy power from their power distribution utility, which buys the bulk of its electricity from coal-fired power plants. Companies with energy-intensive manufacturing often have captive generation units, which primarily run on thermal fuel sources.

As of 31 December 2017, India's total installed power capacity was 334 GW³. Thermal power plants accounted for 66 percent of this capacity, while renewables constituted 18 percent (~63 GW).

Even though thermal plants are still the dominant source for power generation in India, renewables' share of capacity has grown by 77 percent since May 2014⁴. Most of this recent addition has come through large scale grid-connected solar power, encouraged by India's National Solar Mission. With falling prices and increased adoption, the cost of renewable-based electricity is now lower than grid tariffs for many companies in India and corporate renewable PPAs are an attractive business model for corporate buyers and developers alike.

The price for renewable power obtained via corporate renewable PPAs depends strongly on applicable regulatory Open Access charges. These charges are revised every year and vary across states and type of electricity connection - projects in states with favorable Open Access charges see much lower total costs.



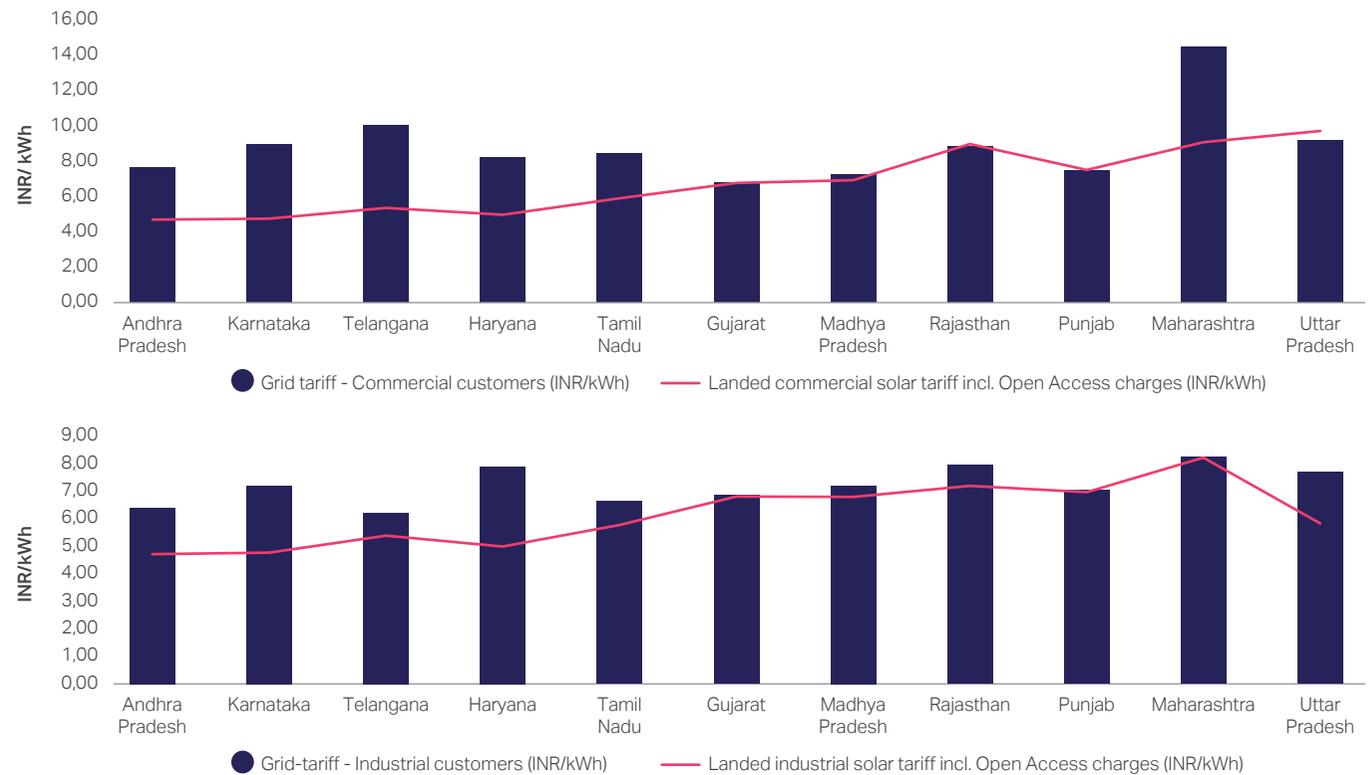
³ Ministry of Power, Central Electricity Regulatory Authority, All India Installed Capacity (In Mw) Of Power Stations, 31.12.2017.

⁴ Ministry of New and Renewable Energy, Year End Review 2017. <http://pib.nic.in/PressReleaseframePage.aspx?PRID=1514215>. The ministry is the nodal Ministry of the Government of India for all matters relating to new and renewable energy.

Figure 1 compares grid tariffs for commercial and industrial companies against Open Access cost for solar projects across various states⁵. The cost of electricity from a solar plant is assumed at INR 4.50/kWh. This is a conservative estimate, as lowest tariffs for utility scale projects in India have reached INR 2.44/kWh (May 2017) for solar and INR 2.43/kWh (Dec. 2017) for wind. State-specific Open Access charges have been added to the assumed electricity cost of INR 4.50/kWh to arrive at landed cost, which is the final cost to be paid by the corporate buyer.

As seen below, even for conservative assumptions, landed solar tariffs, including Open Access charges, are already competitive against grid tariffs in most states.

Figure 1:
Landed solar tariffs vs. grid tariffs for commercial and industrial companies⁶



⁵ Only variable charges have been considered for the calculation of grid tariffs in addition to electricity duty, cess (if any) for commercial buyers connected to High Tension / Low Tension distribution voltage level (depending on state tariff schedule). Variable charges refer to the fuel cost of the power plant for generating electricity as per the given schedule for the day.

⁶ Bridge to India

2. Options for corporate renewable procurement

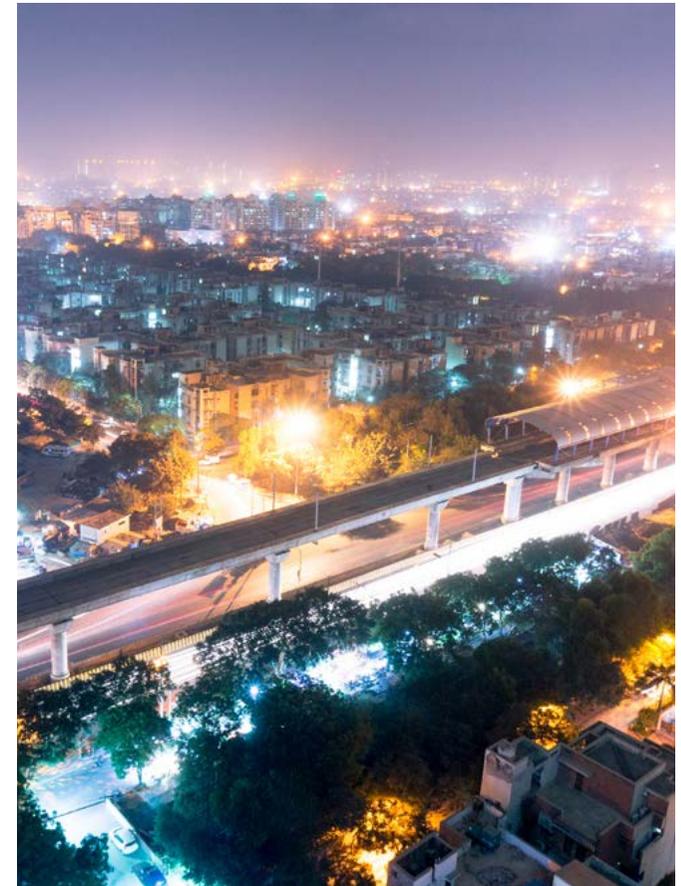


Renewable electricity strategies vary from investing directly in a generation asset, purchasing the power from a third-party's project, to buying renewable certificates. The key advantage of investing directly in a generation asset is that a company can claim tax benefits in the form of accelerated depreciation of the asset and some of the Open Access charges are waived, assuming the corporate buyer owns the asset. However, for many companies owning a generation asset is too far removed from their core business and they often choose to procure power from a third-party using a PPA. Renewable energy certificates are rarely used as pricing of the certificates has not been flexible enough to capture its true value for a corporate buyer and purchase obligations are not consistently enforced.

Wind, solar, biomass and waste-to-energy are the primary renewable sources available in India. Biomass power projects in India are based mostly on agricultural waste. Due to fragmented land holdings and lack of mechanization in the Indian agriculture sector, sourcing of biomass is often challenging. So far, developers have been unable to economically run power projects on biomass.

While many commercial-scale waste-to-energy projects with conversion technologies are operational worldwide, very few plants are successfully operating in India. There has been limited support to scale up the technology and it remains expensive and unviable for competitive power generation.

Wind and solar, on the other hand, are the most commonly used technologies and the cheapest source of new power generation in India⁷. While wind resource availability is region-specific⁸, solar can be used economically across most parts of India. As costs continue to decline, both wind and solar are likely to become ever more attractive to corporate buyers. Falling costs for wind and solar power plants also mean that there is a tendency on behalf of corporate buyers to wait for further reduction in costs. This can delay adoption. Corporate buyers need to evaluate the most suitable time for their procurement, considering the ongoing technology development and the evolving regulations governing the process of power procurement.



⁷ Financial Times, India's cheapest energy sources are solar and wind. <https://www.ft.com/content/17fb4bf8-1947-11e7-9c35-0dd2cb31823a>

⁸ Wind power projects are only located in areas with consistently high wind speeds. Such locations are limited to states such as Tamil Nadu, Maharashtra, Gujarat, Rajasthan, Karnataka, Andhra Pradesh and Madhya Pradesh.

In India, there are three common types of corporate PPAs:

- For the sale of power from a solar rooftop project,
- For the sale of power from a utility scale renewable power project, and
- For the sale of power from a utility scale renewable power project structured as a captive project.

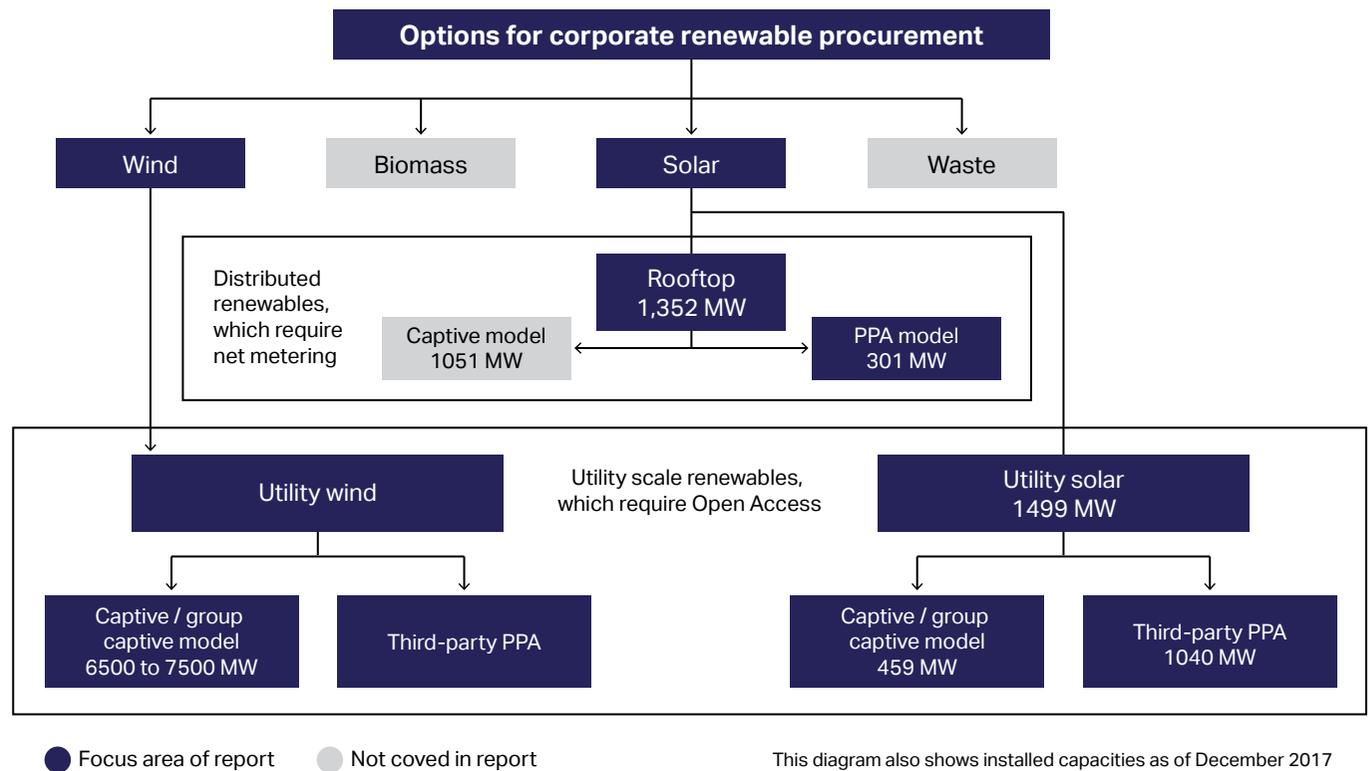
A corporate buyer will evaluate the available procurement options based on the company's sustainability and purchasing strategy, the characteristics and location of its electricity demand, local resource availability and state-level regulations. If a company has multiple facilities, demand can be aggregated across different locations, however if these facilities are in multiple states, the benefits of aggregation should be judged against the increase in Open Access charges.

Corporates also need to decide on the capacity of their project. Solar can be installed in a distributed manner on the rooftop of buildings or in a centralized manner at utility scale. Utility scale projects offer economies of scale but need to pay Open Access charges for the wheeling of power from generation to consumption points. Solar rooftop projects are relatively easy to install and face limited regulatory barriers but might only provide a fraction of the power demand of a corporate buyer.

In this report, we focus on corporate renewable PPAs for solar rooftop projects and utility scale wind and solar projects (third-party and captive projects).

Figure 2 provides an overview of these options.

Figure 2:
Options for corporate renewable procurement



Solar rooftop PPAs

Solar rooftop installations use two primary business models: the captive model and the PPA model.

1) Captive model

Under the solar rooftop captive model, the corporate buyer makes the upfront capital investment, therefore the model is also known as Capital Expenditure (CAPEX) model. The corporate buyer owns, operates and maintains the project.

2) PPA model

Under the PPA model, a third-party invests, either using its own equity or through investors, to build a project on the rooftop space of the corporate buyer's facilities. The generated electricity is then sold to the corporate buyer at a pre-determined tariff. This model is also known as the Operating Expenditure (OPEX) model.

There are three subsets of the PPA model set out in Figure 3.

Figure 3:
Three subsets of the solar rooftop PPA model

BOOT

- The developer builds, owns, operates and transfers ownership (BOOT) of the solar rooftop power plant as per the agreed terms of the PPA, generally at the end of 10 -15 years.
- The transfer of the asset is undertaken after the capital investment has been recovered, with a suitable rate of return.
- After the transfer of ownership, the operations and maintenance are the responsibility of the corporate buyer.

BOOM

- Under the BOOM model, the developer builds, owns, operates and then continues to maintain (BOOM) the solar rooftop power plant as per agreed terms of the PPA.
- The capital invested, and the operation and maintenance charges are recovered over the contracted period. The asset is depreciated and potentially salvaged at the end of life, without being transferred to the corporate buyer.
- BOOM is a variant of the BOOT model with a relatively longer PPA term.

Commonly used in India

Leasing

- The leasing company builds the solar rooftop power plant which is leased to the buyer.
- The buyer pays a fixed monthly leasing rental to the leasing company.
- These projects are generally built with a finance lease model. The contracts and financial accounting are complex compared to other models.
- Corporate buyers might not want to report the PPA as a financial lease as it can have an impact on the company's balance sheet.

Not particularly common in India

Utility scale renewables

A typical solar rooftop power plant may not be able to meet the substantial power demand of an industrial or commercial customer, due to space constraints. To ensure larger renewable generation, corporate buyers can opt for utility scale grid-connected plants. In India, many corporate buyers opt for a utility scale solar or a utility scale wind project.

There are two procurement models which are typically used: Third-party PPAs and captive / group captive models.

1. Third-party PPAs

A third-party investor/s invest in a project and sell the power to the corporate buyer via a PPA. With this model, there is no upfront investment and no operation and maintenance responsibility for the corporate buyer. However, Open Access charges are applicable on the power being wheeled from the generation site to the corporate buyers' location.

2. Captive / group captive model

In the captive model, equal to the solar rooftop captive model, the corporate buyer for a utility scale renewable project makes the upfront capital investment. The corporate buyer owns the power generating asset, operates and maintains it over its lifetime. Open Access charges are applicable, but unpredictable charges, such as the cross-subsidy surcharge and additional surcharge, are waived. Under this structure, a corporate buyer who holds the asset on its books, is also eligible to claim tax benefits through accelerated depreciation.

A variant of the captive model is the group captive model. Under the group captive model, a project is developed for collective usage of one or many corporate buyers. As per the regulatory definition, an arrangement is considered group captive if at least one corporate buyer holds a minimum of 26 percent of equity in a project and consumes at least 51 percent of the power.

For the corporate buyer to avail the Open Access benefits of a group captive project without completely owning the project, a developer can get involved and arrange investments up to 74 percent of the equity - with the corporate buyer holding at least 26 percent equity to meet the ownership criteria. A PPA can be signed on mutually agreed terms between the developer and the corporate buyer. In such a project, the responsibility of operating and maintaining the project are often passed on to the developer.



3. Key terms of PPAs



Based on the location and volume of a company's electricity demand, a corporate buyer will evaluate the above models and choose the one that best fulfils the company's purchasing and sustainability strategies. To structure a balanced contract, the counterparties involved need to reach common ground on several commercial, legal and operational aspects of the project. Some key considerations are explained below:

1. Tenor

From a developer's perspective, the ideal tenor for a corporate PPA for a new built plant is 25 years, equal to the lifetime of the project. However, many corporate buyers are hesitant to sign contracts with long tenors. Corporate PPAs for solar projects in India typically have a tenor of 10 - 15 years with limited flexibility to terminate the contract, induced by the developer's requirement to service the debt of the project.

2. Capacity

Contracted capacity for solar rooftop projects with commercial and industrial buildings ranges between 100 kW and 1 MW. Most utility scale PPAs are between 1 MW and 10 MW. For utility scale projects, developers often aggregate demand from different corporate buyers to set up larger "solar parks" allowing attractive tariffs for corporate buyers.

3. Price structure

Price is the most important issue in project negotiations between the developer and corporate buyer, which usually take place in a competitive environment where a buyer is considering multiple power procurement options from different power sources and from different developers.

In the nascent market, price structures are still evolving. Current price structures include:

Common types of price structures

Fixed price with fixed escalation

This is the most commonly used price structure as of date: Developers offer a lower initial price to be attractive to corporate buyers from day one, with an annual fixed escalation of one to four percent.

Fixed price with zero escalation

This price structure provides uniform cash flows across the project life and reduces buyer default risk in the future as savings against the grid tariff are likely to increase over time.

Fixed price with escalation directly linked to the escalation in grid tariffs

Under this structure, price escalation is directly linked to the escalation in grid tariffs for that corporate buyer.

Fixed price with fixed escalation but renewable tariff capped at applicable grid tariff for that year

This structure protects the buyer against a scenario where, in any year, the company ends up paying more for renewable power than it would for grid-based power.

4. Commercial operation date

The developers and corporate buyer should agree on a clearly defined commercial operation date (COD). The developer must commission the plant and obtain Open Access approval and/or execute a wheeling and banking agreement with the state utility. Obtaining the approval and executing the agreements are often time-consuming and some of the biggest challenges in the Open Access market.

There can be resistance from utilities to grant approvals and hence, parties should diligently review the procedure for commissioning and Open Access approvals in the relevant state to ascertain the specific document(s) required. Unfortunately, many states do not have a codified procedure that sets out the pre-commissioning activities. In these circumstances, developers often rely on local precedents and informal clarifications from the state authorities.

It is therefore important to have clarity on how the COD is defined within the state, particularly as fiscal incentives offered by the state may be linked to the COD.

5. Operational responsibilities (specific to solar rooftop)

The terms of the PPA should clearly define and segregate various operational responsibilities between the buyer and the developer. This helps limit conflict.

While most corporate buyers and developers would agree to the below responsibilities, in certain cases, the corporate buyer may not want to take on responsibilities such as providing water, internet or other site infrastructure.

Typical operational responsibilities

Buyer's responsibilities

- Ensure preparation of the site for construction (including removal of any obstructions).
- Provide adequate soft water for cleaning the plant, a broadband internet connection and secure, internal and external space for storage of equipment and spare parts as well as for installation and operation of the plant.
- Pass on any information regarding notices/information concerning the project.
- Document and provide access rights.
- Support procedures with the utility, if necessary, to receive grid-connection permissions (documentation, signing of forms, etc.).
- Ensure physical security of the plant and restrict access to it.

Developer's responsibilities

- Finance, design, procure, construct and maintain the plant.
- Ensure integrity of the rooftop to prevent leakages.
- Ensure work does not restrict or interfere with the activities of the corporate buyer.
- Make or pay for any repairs that may have to be carried on the premises due to the developers' activities.
- Ensure all permissions are in place for grid access.
- Obtain and maintain all other necessary approvals.
- Procure and maintain all insurances required.
- Clean and maintain the plant to keep the Capacity Utilization Factor (CUF) within the prescribed band.

6. Billing, payments and performance security

Internal policies of the corporate buyer typically determine the payment mechanism because it's difficult for them to make exceptions to company wide rules for electricity procurement. Therefore, there is no market standard. Parties must mutually discuss and agree to the payment mechanism, including time allowances to receive payments (typically 15 days), late payment surcharges and early payment discounts. That said, late payment charges in the range of 9 - 18 percent per annum are common. Early payment discounts are usually 0.5 - 1.0 percent if the payment is made within seven days of receiving the invoice.

The corporate buyer's credit rating often influences the developer's decision to enter a PPA. Some developers may rely solely on the corporate buyer's credit worthiness while others insist on a payment security instrument. Typical instruments include bank guarantees, corporate guarantees or letters of credit that cover average payments for three to six months.

In some cases, corporate buyers may request a performance security from the developer. While there is no market standard, performance securities typically come as a bank guarantee and are maintained until the project is commissioned or a few months thereafter. The performance security should cover delay damages and any termination compensation if the developer does not complete the project by the agreed commissioning date.

7. Termination

Termination clauses are often much-negotiated in a corporate PPA. Solar rooftop PPAs have more stringent termination options and often require hefty compensation if the buyer terminates the agreement. This often acts as a deterrent for a premature exit and provides investment security for the developer and financiers of the project.

Typically, lenders financing renewable energy projects insist on a PPA with a term equal to or greater than the tenor of the project debt service period. Consequently, developers seek similar PPA terms with a specified lock-in period, during which neither party has the right to unilaterally exit the contract.

On the other hand, corporate buyers generally prefer shorter lock-in periods, as they consider the possibility of further reductions in renewable energy costs or future reduction in electricity demand at the location. Balancing these two divergent expectations can be a challenge in deal making.

Default-based termination

Corporate PPAs should clearly define default events and consequences of termination including termination compensation.

Developer default events include failure to commission the generating plant and commence power supply by the specified date or failure to meet the annual power supply amount within the specified error margin.

For instance, repeated instances of delayed payments or payment failure by the corporate buyer should be a default event, entitling the developer to terminate the PPA and claim termination compensation.

For both developer and buyer defaults, termination compensation typically amounts to anywhere from six months to three years of difference between the utility tariff (or average power purchase cost) and the PPA price.

Termination because of force majeure or change in law

Parties commonly provide a right to exit the PPA in the event of force majeure or a change in applicable law that materially affects either parties' ability to perform its obligation in a commercially viable manner. In these instances, it's typical that neither party has the right to claim termination compensation from the other party.

Termination in a group captive model

Given the regulatory requirement for the lead captive buyer to own a minimum of 26 percent of the power generating plant, ownership must be transferred to another captive buyer or back to the primary investor if the PPA terminates or expires.

Parties typically agree to a put/call option structure to transfer the shares upon expiry/termination of the PPA. If either the captive generator or the buyer is a non-resident or foreign-owned and controlled entity, then subscription/purchase of equity shares as well as subsequent transfer must comply with the Reserve Bank of India's pricing guidelines.

8. Sharing policy benefits and the regulatory upside

Buyers and developers should ensure the PPA terms set out who benefits from policy and/or regulatory incentives and concessions. A 50 - 50 split of potential regulatory upside is common.

Renewable Energy Certificates (REC)⁹ have been used as a market-based instrument to promote renewable energy and to facilitate compliance under renewable purchase obligations (RPO)¹⁰. In the past, the value of RECs to meet internal RPO or to realize monetary gain on the market have been a significant driver of renewable energy projects. But the future of RECs, particularly for solar projects, has become uncertain. It is possible that RECs or other incentives can further on support the economics of corporate renewable PPAs in the future.



⁹ One Renewable Energy Certificate represents 1 MWh of electricity generated by a renewable energy power plant. Renewable energy generators receive this certificate when they sell electricity generated from their plant as normal electricity and claim the renewable energy component of this electricity under the REC mechanism. The forbearance price of solar RECs is INR 2500/MWh and for non-solar RECs is INR 2900/MWh, the floor price for solar and non-solar RECs is INR 1000/MWh.

¹⁰ This is a mechanism by which entities are obliged to buy a defined quantity of renewable energy of their overall consumption. Utilities, captive buyers and Open Access consumers are entities generally obliged under an RPO.

4. The regulatory landscape



Both solar rooftop and utility scale renewables require access to the grid. The access and associated charges are regulated. Most power sector regulations in India were designed with utility scale thermal power plants in mind and, in recent years, several changes have been incorporated to accommodate an increasing share of renewable power - but this is still work in progress.

1. Net metering

Net metering is a billing mechanism allowing on-site renewable power plants to feed excess electricity to the grid, reducing their own electricity bills by a corresponding number of units. Net metering is usually limited to solar rooftop (on-site or near-site) plants, though some states allow other sources to qualify as well.

The advantages of net metering include avoiding Open Access charges and reducing regulatory risk. However, installed capacity for plants under net metering is capped at 1 MW in most states. It is also often constrained to a certain percentage of the corporate buyer's sanctioned load or the distribution transformer capacity in the area where the plant will be connected. Faster capacity growth could be unlocked if these restrictions were lifted.

Due to space and size limitations, on-site projects may be insufficient for some companies. They can consider utility scale renewable projects under the Open Access scheme.

Net metering explained: A corporate buyer has a power demand of 1 million kWh in a year and installs a solar rooftop plant of 500 kW capacity, which generates around 700,000 kWh in a year. The generation profile of the solar plant implies that only 400,000 kWh can be consumed at the time of generation and the remaining 300,000 kWh are banked with the grid. In the absence of net metering, the power demand of the utility will be 600,000 kWh (1,000,000 – 400,000kWh). With net metering applied, the net demand will be only 300,000 kWh.

2. Open Access

Open Access is an important regulatory mechanism that affects the final tariff paid by the corporate buyer. It allows large consumers with a connected load greater than 1 MW to obtain electricity from suppliers other than the local electricity distribution company¹¹.

Open Access charges under a utility scale renewable project vary with location and procurement models, as discussed previously. Renewable power plants under a captive or group captive model are generally exempt from many of these charges, varying by state.

¹¹ The eligibility criteria of 1 MW is not part of the Electricity Act but issued by various state regulators in their Open Access regulation. It varies from state to state. These eligibility requirements are for an individual facility, and not for consolidated demand. Thus, if the state has declared a minimum 1 MW of contract demand as eligibility criteria, all facilities with a contract demand less than this threshold are not eligible for Open Access transactions, even if their demand is aggregated by a single corporate. There are exceptions to the eligibility criteria. For example, Haryana allows Open Access for premises with a sanctioned load of over 500 kW and Uttarakhand allows for a sanctioned load of over 100kW.

¹² With long-term Open Access, dedicated infrastructure is allotted for the project. The user pays on a capacity basis for the use of the infrastructure irrespective of the units fed into the grid. Under short- and medium-term Open Access, there is no dedicated infrastructure. The permission to feed power is provided only if the bandwidth is available on the existing network and therefore is charged on a per unit basis.

Various charges under the Open Access mechanism include:

- a. Transmission charges:** these are payable to the transmission company for using the transmission infrastructure. They are in the range of INR 50,000 to 200,000/MW/month for long-term Open Access buyers and in the range of INR 0.10 to 0.50/kWh for short-term Open Access buyers¹².
- b. Wheeling charges:** These are payable to the distribution company for using the distribution network. They are applicable to all power generating plants connected to the distribution grid at 33 kV or below and using Open Access. They are typically in the range of INR 0.10 to 0.80/kWh.
- c. Transmission losses:** Electricity lost in the transmission line between point of generation and the point of consumption. Typically, these are in the range of two to six percent.
- d. Wheeling losses:** Electricity losses incurred in the distribution network. They are determined by the State Electricity Regulatory Commissions (SERCs) for each buyer category and typically range from four to ten percent.
- e. Cross subsidy surcharge (CSS):** Payable by commercial and industrial buyers to fund the tariff subsidy for agricultural and residential buyers. When a buyer opts for Open Access, the distribution company loses a high-value income which would have subsidized low-income electricity users. This surcharge is designed to make up for the lost subsidy.

- f. Additional surcharge (AS):** Imposed to recover the cost of stranded assets when corporate buyers leave the distribution company and procure power through Open Access. The utility needs to prove to the regulator that assets are stranded to impose AS. It is generally imposed over a period of six months as seasonal demand varies.
- g. Banking charges:** Banking of power is when a developer can virtually "store" the power generated with the utility if the buyer is unable to use it at the time of generation. Methods of such electricity accounting vary from state to state, but broadly it is either done on time-block basis (15 minutes to a few hours or peak and non-peak hours) or on gross monthly basis: In time-block based accounting, electricity

generated during a particular time-block needs to be adjusted against consumption recorded in the same time-block. Any surplus power will be banked. With gross monthly electricity accounting, the total electricity generated is adjusted against the total electricity consumed in that month, and the surplus is banked. Banking of power is possible under net metering an Open Access. The state regulators set banking regulations which allow utilities to charge the generator for the banking facility (typically two percent of the banked power) and define periods during which the banked power may be withdrawn i.e. withdrawal during peak consumptions is usually not allowed.

Open Access can be categorized as intra-state or inter-state. Intra-state Open Access falls under the SERC. Inter-state Open Access can be expensive as it is subject to the regulations and charges of the central authorities as well as both the states of generation and consumption. Combined Open Access charges may be as high as 150 percent of the energy-only cost.

Open Access can be further classified as:

1. Short-term Open Access: for a period of less than a month.
2. Medium-term Open Access: for a period of three months to three years.
3. Long-term Open Access: for a period of 12 - 25 years.

Any company looking for a period between three and 12 years may opt for medium-term Open Access up to four times or could chose a long-term access for 12 years and then terminate the contract early after paying the necessary charges as per the agreed terms.

Exemptions from Open Access charges

Open Access charges vary based on the state of generation and consumption. Variations stem from the extent to which a state wants to promote renewables. The below table provides an overview of solar and wind policies in key states.

Open Access charges exemptions applicable to renewable energy projects¹³

State	Open Access charges for solar power	Open Access charges for wind power
Andhra Pradesh	<ul style="list-style-type: none"> CSS waived for five years from COD. Transmission and wheeling charges waived for captive model/third-party sale within the state. Distribution losses exempted for projects injecting at 33kV or below. The exemptions are available for projects built by March 2020. 	<ul style="list-style-type: none"> Transmission and wheeling waived for captive model/third-party sale within the state. The exemptions are available for projects built by March 2020.
Gujarat	<ul style="list-style-type: none"> Electricity duty, 50 percent of CSS and AS waived. Incentives apply for 25 years from COD for projects built by March 2020. 	<ul style="list-style-type: none"> 50 percent of CSS and AS waived. Incentives apply for 25 years from COD for projects built by June 2021.
Haryana	<ul style="list-style-type: none"> Wheeling, transmission and distribution, CSS, reactive power charges, electricity duty, tax and cess are waived for 25 years from COD for projects commissioned during the policy period. The policy will remain in force until a new policy is notified. 	n/a
Karnataka	<ul style="list-style-type: none"> Wheeling charges and CSS waived for 10 years. Transmission charges and losses and banking charges waived. Reduced charges apply to plants built by March 2018. KERC has proposed that 25 percent of conventional wheeling and banking charges to be made applicable for renewable energy. 	<ul style="list-style-type: none"> Wheeling charges at five percent and banking charges at two percent of injected electricity. Charges apply to plants built by March 2018. KERC has proposed that 25 percent of conventional wheeling and banking charges to be made applicable for renewable energy.
Madhya Pradesh	<ul style="list-style-type: none"> Wheeling charge of two percent. CSS and AS waived until November 2017. Revision of policy has resulted in CSS and AS being applicable from December 2017 onwards. 	<ul style="list-style-type: none"> Wheeling charges of two percent. CSS and AS waived until November 2017. Revision of policy has resulted in CSS and AS being applicable from December 2017 onwards.

¹³ Bridge to India

(continued..)

Open Access charges exemptions applicable to renewable energy projects¹³

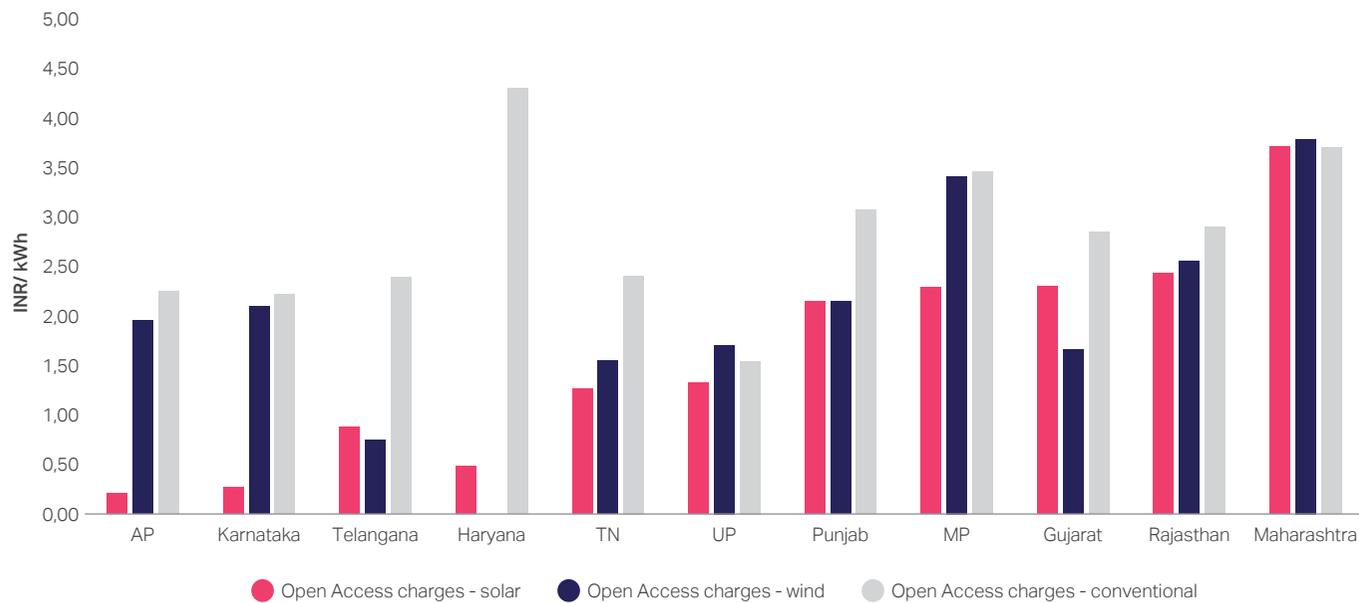
Maharashtra	<ul style="list-style-type: none"> No exemptions 	<ul style="list-style-type: none"> No exemptions
Punjab	<ul style="list-style-type: none"> Transmission and wheeling charges reduced to two percent of energy injected. Banking charges waived. The waivers are available for the current financial year and continue until changed in subsequent tariff orders. 	<ul style="list-style-type: none"> Transmission and wheeling charges reduced to two percent of electricity injected. Banking charges waived. The waivers are available for the current financial year and continue until changed in subsequent tariff orders.
Rajasthan	<ul style="list-style-type: none"> CSS is waived for all solar plants commissioned between April 2014 and March 2019. The exemptions aren't available from April 2019 unless the policy and regulation are extended. 	<ul style="list-style-type: none"> CSS is waived for all wind plants commissioned between April 2014 and March 2019. The exemptions aren't available from April 2019 unless the policy and regulation are extended.
Tamil Nadu	<ul style="list-style-type: none"> Transmission, wheeling charges, scheduling and system operation charges at 30 percent of conventional power. 50 percent of CSS waived. The waivers are available for the current financial year and continue until changed in subsequent tariff orders. 	<ul style="list-style-type: none"> Transmission, wheeling charges, scheduling and system operation charges at 30 percent of conventional power. 40 percent of transmission and wheeling charges waived. 50 percent of CSS waived. The waivers are available for the current financial year and continue until changed in subsequent tariff orders.
Telangana	<ul style="list-style-type: none"> CSS waived for five years from COD. Transmission and wheeling charges waived for 10 years for captive consumption within the state. The exemptions are available for projects built by March 2020. 	<ul style="list-style-type: none"> CSS is exempt for five years from COD. The exemptions are available for projects built by March 2021.
Uttar Pradesh	<ul style="list-style-type: none"> The state exempts 50 percent of wheeling and transmission charges for plants commissioned between April 2017 and March 2022. The exemptions shall not be available from April 2022 unless the policy and regulation are extended. 	<ul style="list-style-type: none"> All Open Access charges are applicable. Only electricity duty is exempted.

¹³ Bridge to India

Figure 4 compares charges payable by industrial and commercial companies in different states. The calculations assume that the company is connected at 33 kV with a 1 MW solar or wind plant at an energy-only

tariff of INR 4.50/kWh or a conventional plant at INR 3.50/kWh. These values are not necessarily representative of the actual costs but are used to illustrate Open Access charges.

Figure 4:
Comparison of solar, wind and conventional Open Access charges for industrial buyers¹⁴



¹⁴ Bridge to India

5. Challenges



In mature markets, corporate PPAs have been partially standardized to meet local market conditions. While corporate PPAs in India have developed significantly over the past year, the process for localization and standardization is still under way. This section outlines contractual, operational and regulatory challenges – some of which can be solved with the establishment of local standards.



Challenges for solar rooftop PPAs

1. Contractual challenges

Contract enforceability

Contract enforcement is difficult in India and in many cases, dispute resolution can take years. Contract enforceability is a challenge to the growth of the corporate renewable PPA market because the business risk for investors increases beyond the bankable first-tier buyers.

Tariff renegotiation

With falling tariffs for solar and wind energy, PPAs signed today might seem expensive in five years' time. Corporate buyers with high priced PPAs may want to renegotiate the agreed conditions in the future, which due to poor contract enforceability poses an inherent economic risk of contract default. This risk is increasing, particularly as developers might be compromising on corporate buyer's credit quality to scale up quickly. Stringent due diligence on creditworthiness and reputational status of potential corporate buyers can help to mitigate this risk.

With little or no alternative offtake options in the event of a corporate buyer default, termination provisions (including termination compensation) are critical for any investments in solar rooftop PPAs.

Contract standardization

There are currently no regulatory guidelines or template contracts setting out common positions for

all stakeholders of a corporate PPA. Corporate buyers and developers must agree on all contractual terms on a case by case basis – though some terms have informally become commonly taken positions. The absence of standard contracts increases the due-diligence effort and raises costs for all parties.

2. Operational challenges

Limited space for installation

For most commercial and industrial buildings, solar rooftop power plants can fulfil less than 10 percent of the building's total power consumption due to limited rooftop space availability. From an economic perspective, this may lead a corporate buyer to choose another form of electricity generation.

Rooftop access

The developer needs to be granted continued access to the roof for the entire duration of the installation – this is a necessity for maintenance and operation of the plant and hence its commercial viability. Similarly, the developer needs to be able to take charge of the asset in the case of a termination or a dispute.

Technical issues

Shadow from other structures off and/or on the roof, such as water tanks and antennas or new structures, can become a concern for power generation.

3. Regulatory challenges

Net metering

All states in India have established policies for net metering. There is no standard country-wide process for net-metering approval as it varies across states. Moreover, in most states, delays in receiving net metering approvals can keep plants underutilized for months after commissioning.

4. Commercial challenges

Project acquisition and appraisal costs as a percentage of deal size

From a developer's perspective, although the size of installations for solar rooftop plants is smaller compared to a utility scale plant, absolute business development and appraisal costs are not proportionally lower. Hence, the economic viability of solar rooftop projects needs to be proportionally higher to cover these costs, while remaining a suitable profit margin.

Accelerated depreciation benefits¹⁵

Developers and investors are usually not able to claim accelerated depreciation benefits as projects are set up under a new legal entity, or Special Purpose Vehicle (SPV).



Challenges for utility scale renewables

1. Contractual challenges

Tenor mismatch between PPA and loan

A new renewable energy plant typically requires debt with a tenor of 10 - 15 years. Some corporate buyers may be looking for short-term PPAs (as low as one year). Non-recourse financing will not be offered if there is a mismatch between the corporate buyer's lock-in period and the developer's debt tenor.

Contract enforcement

To be able to finance a project, investors need to ensure that the proposed offtaker is bankable with strong and consistent financials. Solar and wind tariffs have rapidly declined in the last two years, creating a risk that corporate buyers may wish to renegotiate existing corporate PPAs. In contrast to solar rooftop projects, alternative corporate buyers for an off-site project may partially mitigate this risk. In that case, investors may ask for a payment security to cover the cost of transferring the contract to a new corporate buyer.

Contract standardization

Same as under solar rooftop PPAs.

¹⁵ Accelerated depreciation is a method used to depreciate assets in a manner that allows greater deductions in the first few years.

¹⁶ Most of the renewable power in India is being bought by state-owned power distribution companies who are mandated to meet a share of the demand on their network through renewable power. This procurement is done based on guidelines set under central and state government policies and often require that the procurement is done through a competitive bidding process.

2. Operational challenges

Grid curtailment risk

Open Access projects are typically smaller than projects contracted by state-owned power distribution companies¹⁶. They are often connected to state grids at 11/33 kV. As a result, there is a risk of grid unavailability. However, corporate buyers are not typically willing to take any grid availability risk. They may even want to impose penalties on the developer for power unavailability.

Performance risk

The renewable energy sector has attracted an increased number of inexperienced entrants over the past years, primarily due to higher tariffs and tax benefits such as accelerated depreciation. There is a risk that such developers may compromise project quality, which could result in lower generation, leading to penalties or even termination of PPAs.

3. Regulatory challenges

Uncertainty around Open Access regulations and charges

Corporate buyers must pay Open Access charges to wheel power from the generation site to their premises. State regulators determine these charges periodically, so they are generally only valid for one to three years. As a result, corporate buyers cannot accurately budget for these charges beyond a couple of years. Furthermore, some charges, such as the CSS and the AS, can vary from one approval period to the next. Uncapped and unpredictable changes to Open Access charges discourage long-term corporate PPAs and investments in new capacity. As a recommendation, visibility for Open Access charges should be provided for 5 - 10 years. Alternatively, changes to such charges should be curbed or at least capped, particularly for existing projects with signed PPAs.

Inconsistency in eligibility and operating criteria for Open Access

The SERCs in each Indian state frame the Open Access regulations applicable in their jurisdictions, while utilities prepare the relating operating procedures. There have been efforts by utilities and/or by central authorities to create standard processes across different states. The variation in eligibility criteria, application processes and electricity accounting across states makes it a difficult task for corporate buyers to own a PPA portfolio across India.

Exclusion from Open Access

Most of the power consumers in India have a connected load of less than 1 MW and are ineligible to procure power through Open Access.

The utilities point of view

Delay or refusal to grant Open Access permission by utilities can be due to lack of procedural knowledge at the local level or a commercial resistance due to potential loss of revenue as the corporate buyer is leaving the utility. It is a hurdle that corporate buyers and developers face regularly. The procedure for obtaining approvals should be clearly defined, training could be provided to local utility employees and regulations should be defined such that utilities are fairly compensated for the use of their network and have the flexibility to compete with private sector developers for sale of renewable power to corporate customers.

Paper-based approval process

Open Access approval forms are often paper-based. A digital process would improve transparency in decision making and could improve process time. States could implement an online approval process that works across multiple states, utilities, system operators and regulators.

6. Financing corporate renewable PPA projects



Financing corporate renewable PPAs has been a challenge for project developers in India. While there are different avenues for funding, high interest rates remain a challenge for renewable projects. Additionally, investors and banks have had difficulties evaluating renewable projects, due to limited data on project performance. As a result, a significant amount of research was required before a lending decision could be made. Today, lenders' appetites have increased due to experiences with utility scale projects under central and state government policies. There are also multilateral financial institutions, like the World Bank and the Asian Development Bank, who operate lending programs to Indian banks.

The available financing options are:

1. On-balance-sheet financing

Sellers with strong financing capacity can opt for on-balance-sheet financing to develop and build small- to medium-sized projects. Projects are financed off the company's equity, operating cash flow or debt capital. Debt capital can be raised from corporate credit lines, bonds or project-specific bank investment loans with liabilities secured against the main corporate assets or backed by collateral or corporate guarantees.

In India, this is most common type of debt financing available for corporate PPA projects.

2. Project finance

Project finance deals can fund an economically separate project on either a limited-recourse or a non-recourse basis. The cash flow from the project will be used to provide the return on equity and service any project debt.

Project financing separates the asset from other business activities to isolate the cash flows generated by the asset. This separation is achieved by setting up a new project company, an SPV, for each individual renewable project, or by ring fencing the cash flow of the project through other mechanisms. Using an SPV, stakeholders can also create asset-specific governance systems to address agency conflicts in ways that balance sheet finance cannot replicate. Both the owner and lenders can protect themselves from agency risk.

Even though this is a desirable method of financing in the Indian context, lenders may only be willing to lend on a project finance basis to projects where the offtaker is a bankable entity and Open Access risks are negligible. Credit ratings of "A" and above (as per domestic rating standards) are usually considered bankable.

3. Financing from multilateral development banks

The World Bank, the Asian Development Bank (ADB) and the KfW have announced credit lines to domestic lenders to, in turn, offer low cost financing for solar rooftop projects in India. The World Bank, e.g., has extended their concessional line of credit to the State Bank of India. Similarly, the Asian Development Bank has made agreements with the Punjab National Bank, while the KfW is working with the Indian Renewable Energy Development Agency Limited (IREDA).

Recently, the State Bank of India shortlisted solar rooftop project developers based on selection criteria approved by the World Bank. These developers will be offered low-cost finance for grid-connected solar rooftop projects. The funding for these projects will come from the credit line offered by the World Bank. In this particular process of availing the sanctioned disbursement amount, project developers have been facing procedural challenges:

- The internal documentation and processes in the local State Bank of India branches managing the disbursements were not clear, leading to delay in decision making cycles at the assigned local branches.
- Some rooftop owners were not comfortable sharing the lease agreements, required by State Bank of India.

With increased number of disbursements, awareness and internal capacity building by national banks, the process is likely to smooth out over time.

4. Capital market financing

Capital markets are a worldwide source of funds for renewable energy projects. They have, however, not yet been used for corporate PPAs in India. One option for projects to raise money on capital markets is through securitization - issuing collateralized, tradable bonds. The security is backed by the renewable energy project's assets and serviced from the asset's cash flow. Securitization would typically be used for existing assets and may be a refinancing option.

Securities are eligible for insurance, guarantees and other forms of credit enhancement. The security obtains a credit rating, which facilitates trading on the secondary market and qualifies them as suitable investments for pension funds and other institutional investors. However, it can be difficult to securitize a project unless there is a PPA of a longer tenor (at least five years) with a financially strong buyer and a stable regulatory regime.

Both small and large highly-rated companies, can opt for securitization in conjunction with other forms of borrowing to diversify their funding sources.

Advantages of securitization for investors and lenders include:

- a. Potentially lower funding costs through diversification: A pool of securitized assets together may offer a more attractive risk-return profile than that of an individual owner. The resulting higher credit quality may lead to lower cost of funding.
- b. Liquidity to foster the owner's growth: Securitization provides a reliable and relatively unconstrained source of off-balance-sheet financing, mitigates traditional funding constraints and can promote a company's growth by freeing up capital from the owner's balance sheet for other business.
- c. Diversified funding sources: Both small and large highly-rated companies rely on securitization with other forms of borrowing to diversify their funding sources.
- d. Regulatory capital relief: Lenders can liquefy major illiquid assets to benefit from regulatory capital relief.
- e. Over a period of time, following global trends, lenders can efficiently manage country-specific, technology and sponsor risks through securitization.

5. Direct lending

A direct lending (or bank-to-corporate structure) is a traditional documented loan in which the seller imports the renewable energy technology and the lender is the bank of the renewable energy technology supplier. The bank pays the supplier directly from the proceeds of the loan agreement. The direct loan to the seller can either be secured by the seller's balance sheet (International Financial Reporting Standards reporting is required in this case) or additionally backed by a local guarantor (a company or local bank) providing further credit enhancement (e.g. a payment guarantee). The exporter's bank is covered by a guarantee from the export credit agency.

6. Intermediary lending

Intermediary lending (or bank-to-bank model) is a renewable energy export finance structure. The bank of a renewable energy technology supplier lends funds to a financial intermediary, usually the local bank of the seller in a renewable PPA, who then lends these funds to the seller. The supplier is directly paid by its bank from proceeds of the loan agreement following presentation of pre-agreed documents (such as a bill of lading).

7. Expected market developments



Grid retail tariffs, ease of access to the grid and Open Access charges vary across different states of India. Therefore, each state may follow a different growth trajectory for corporate renewable capacity additions. Corporate buyers with a presence in multiple Indian states may need to adapt their roadmap for renewable purchasing accordingly.

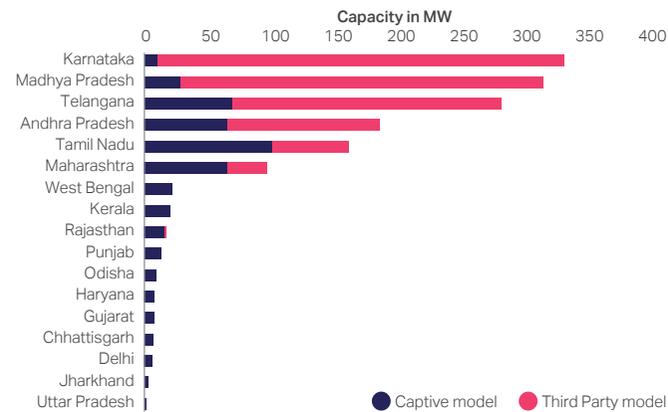
For solar rooftop plants, industrialized states with higher grid tariffs have been the first to contract PPAs. This includes states such as Maharashtra, Tamil Nadu, Telangana, Andhra Pradesh and Karnataka. With continuing cost reductions and emerging best practices, corporate PPAs for solar rooftop will be implemented across the country. The market is expected to grow to 3.5 GW to 4.0 GW by March 2022¹⁷.

The market size for utility scale corporate PPAs is largely dependent on state-level policies and regulations. There was a strong increase in capacity over 2017-2018 in two key states: Karnataka and Madhya Pradesh. This resulted from regulatory charges being waived. However, the favorable policy in Karnataka ended in March 2018 and Madhya Pradesh has recently decided to impose a CSS and an AS, reducing the expected project pipeline. Decreasing renewable tariffs are prompting some states to withdraw regulatory incentives. Decisions to waive or levy Open Access charges can often be ad hoc. Madhya Pradesh decided to levy a CSS and a AS in the middle of the year curtailing

the project pipeline in the state. Ideally, states that have waived Open Access charges should opt for a gradual increase in charges to allow for the market to adjust. However, no state has followed this approach so far.

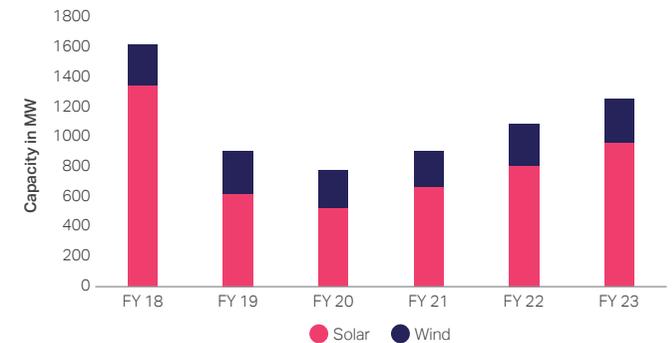
As of 31 December 2017, approximately 2,000 MW of renewable capacity had been built under the Open Access mechanism (see Figure 5). Most of this capacity is located within select states: Madhya Pradesh, Karnataka, Telangana, Andhra Pradesh and Tamil Nadu, mainly due to favorable regulations.

Figure 5: Installed solar capacity under Open Access per state (2017)¹⁸



A second phase of growth is expected to take place in other states with comparatively favorable policies such as Andhra Pradesh, Telangana and Haryana. Moreover, states such as Maharashtra and Gujarat are likely to see an increase in utility scale corporate PPAs, primarily due to their fundamental economic viability and the presence of large corporate buyers. Overall, the utility scale corporate PPA market is expected to add 6.6 GW installed capacity between the financial years 2018 and 2023 (see Figure 6).

Figure 6: Year-on-year capacity addition for utility scale renewable PPAs from financial year 2018 to 2023¹⁹



Note:

Expiry of exemptions for Open Access charges in Karnataka and Madhya Pradesh led to a rush of installations in FY 18. Subsequent years are expected to follow a more normalized growth trajectory for capacity addition.

These projections are based on the market situation during December 2017. If safeguard and anti-dumping duties are imposed, the projection and the mix of solar and wind would likely change.

¹⁷ Bridge to India

¹⁸ Bridge to India. This includes projects which are selling power to the grid at APPC (523 MW). APPC: Average power purchase cost. Renewable energy projects without a specific PPA generally receive this price.

¹⁹ Bridge to India

Current Open Access policies favor solar over wind in almost every state. Moreover, wind speeds are only high enough for projects to be economically feasible in a small number of states - Tamil Nadu, Gujarat, Maharashtra, Rajasthan, Karnataka and Andhra Pradesh. As solar irradiation is also high in these states, the wind sector faces tough competition. Hence, estimates show almost three quarters of new capacity additions in corporate utility scale PPAs from solar.

Expected price developments

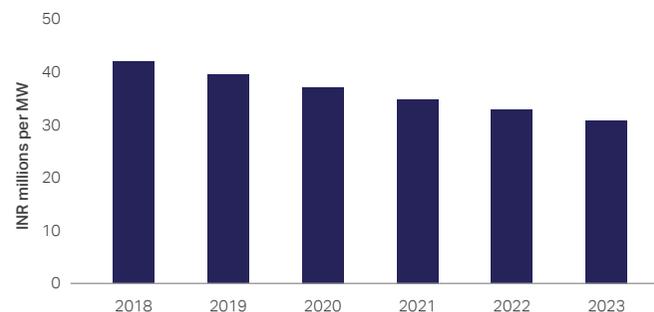
Cost reductions of solar and wind projects have been a major driver of growth for the utility scale renewable PPA market in India.

Falling solar module costs have been the main contributor to price reductions between 2012 and 2017. This is largely due to Chinese manufacturers (over 60 percent of total global manufacturing capacity) who have priced modules at small margins to increase their market share. Recent manufacturer bankruptcies in the US, stretched financial positions of Chinese manufacturers and ongoing trade cases suggest that further declines in module prices worldwide will be gradual and limited. India has among the world's lowest Engineering, Procurement and Construction (EPC) costs, so there is little room for further decline locally.

Similarly, the cost of building wind projects has decreased significantly, as seen in recent auctions for wind projects under government policies, where tariffs have fallen to INR 2.44/kWh²⁰. While further capital cost reductions in wind will be moderate, technological improvements are likely to increase plant efficiency, reducing the cost per kWh.

As seen in Figure 7 below, the per kWh cost of solar is projected to decrease five to six percent per year over the next five years. Prices for a fully commissioned utility scale solar plant in India are likely to decrease from around INR 42 million/MW in 2017 to INR 30 to 32 million/MW in 2020 – an annualized reduction of six percent.

Figure 7:
Solar system costs²¹



²⁰ Financial express media report, Latest auction: At 2.44/unit, wind tariffs at December level. <https://goo.gl/HX2aHn>

²¹ Bridge to India

8. Recommendations for corporate buyers



This section aims to help people in procurement departments who purchase renewable power. It summarizes key messages from this report for a corporate buyer's point of view.

Corporate renewable PPAs are different from other common supply agreements that a company may negotiate and sign on a regular basis.

Firstly, the expected tenor for renewable PPAs is usually longer than other supply contracts. Secondly, without a precedent for a renewable PPA, there is most likely no standard contract template which has been vetted by the company's legal team. Any company's first PPA will be the most challenging, as detailed contract terms will need to be negotiated considering the project and market specific benefits and risks.

Fortunately, the economic case for renewable PPAs is now sufficiently compelling to undertake the challenge of evaluating renewable procurement options and negotiating contracts.

[Chapter 2](#) discussed various options for renewable procurement. Other chapters have discussed key terms, regulatory landscapes and financing. Recommendations that combine key learnings from the above chapters can be summarised as follows:

1. **Due diligence based on company locations:**

Location influences economics and the risk profile of any renewable power procurement. Grid power tariffs, state-level regulations, Open Access charges and renewable resources are all location specific; and are important inputs for commercial evaluation of a project.

2. **Understanding Open Access risks:**

For procuring power from a utility scale renewable project, a corporate buyer should evaluate whether access to the grid is possible at the location and if the Open Access charges are currently favorable. Corporate buyers should then aim to understand regulatory risks from changes in Open Access regulations and evaluate the impact of potential yearly changes to Open Access charges. Companies operating out of multiple locations across India should employ a state-specific strategy for renewable adoption.

3. **Due diligence on the developer:**

To ensure reliability and availability of power as per contracted terms, corporate buyers should carefully choose the developer of their corporate renewable PPA considering the developer's experience in executing quality projects, assessing their long-term interest in operating power plants and judging their financial strength to build and operate these plants. Evaluating equipment for use in the project can reassure the corporate buyer during the plant development stage.

4. **PPA negotiation:**

Supply-demand dynamics make corporate PPAs a buyers' market. This gives sufficient leverage to corporate buyers in negotiation. A competitive tender process and one-to-one negotiations can help reveal the cost of renewable power for a specific location. For a favorable location in India, it should be possible to realize a 20 - 30 percent cost discount as compared to grid power tariffs. From a corporate buyers' perspective, the key to any PPA negotiation is to strike a balance between de-risking a project and discovering the lowest cost of power. In the past, PPAs negotiated only keeping in mind the lowest cost of power, became unfinanceable for the developer and were never built. Similarly, a corporate buyer can use its leverage to negotiate terms (other than cost) expressly in its favor, but increased supplier risk can result in a higher tariff for the corporate buyer.

To conclude, corporate buyers face complexities and difficulties in signing their first renewable PPA. However, any following PPA in India will be less time and cost intensive.

Today, the economic and sustainability case for renewable PPAs is extremely compelling and risks are manageable. For initial adoption, corporate buyers can prioritize progressive states where current policies are the most supportive.

9. Case Studies



These case studies were compiled to help other companies to learn from good practices and previous experience. The data within these case studies was provided by WBCSD member companies participating in the Corporate Renewable PPA Forum and other stakeholders in the Indian corporate procurement market.

IDEA'S SUCCESS STORY IN RENEWABLE ENERGY TELECOM TOWERS: Zero to 12 MW in four years



The goal:

Substantially increasing renewable energy across Idea Cellular's telecom towers.

The background:

Providing telecommunication services requires 24x7 operations and an uninterrupted flow of electricity to keep everything running.

A telecom network consists of Base Trans receiving Stations (BTSs) and Main Switching Centers (MSCs), where the BTSs are deployed across the land, and the MSCs in few central locations. These are all interconnected to provide a seamless telecommunication experience.

Idea Cellular, the third largest operator in India, provides world-class mobile phone services to over 200 million customers through the most extensive telecom network of 0.27 million nodes, constituting 2G/3G/4G BTSs, spread across the country. The annual electricity consumption of these nodes is 1.78 Million MWh. The company wanted to make more of this renewable.

The strategy:

Idea started its Green Telecom journey in 2012 to promote solarization of telecom sites and to offset its electricity consumption by generating power from renewable sources like solar.

In 2016, the company made its intentions public in the FY 2016 Sustainability Report, setting an ambitious target to achieve a 70 percent reduction in carbon emission intensity per Terra Byte of network usage by FY 2021, from its FY 2015 baseline figures.

In 2012, Idea started solarizing non-grid ground-based tower locations in the Indian state of Bihar, and today there are about 1,063 solarized telecom sites operational in the state with a total installed capacity of 4.8 MW. To achieve this, Idea used a unique partner engagement model known as Energy Management Service (EMS), for provisioning solar-based energy generation as well as site operation and maintenance – both combined under one master services agreement.

Next, Idea focused on PPAs against the company's energy consumption at MSCs for both onsite and offsite installations. The onsite solarization project was

also initiated in 2015 and a 29.5 KW solar plant was constructed on the roof of Idea MSC in Noida, near New Delhi. The offsite renewable energy deployment was also initiated in 2015.

Idea's PPAs are service level agreements based on an OPEX model, where monthly payment to the partner is directly related to power injected into the grid. This ensures a win-win scenario during the contract period where there is assured cashflow to the partner and guaranteed generation by the partner.

The outcome:

Today, the cumulative installed capacity of solar plants against the consumption requirements of Idea, by way of PPAs and EMS contracts is approximately 12 MW. The total solar power Idea purchased through the PPA in FY 2017 was 6,551 MWh and in FY 2018 it was 6,576 MWh. The total actual savings by the end of FY 2018 from inception the start of the project was approximately INR 22.23 Million. The emission abatements achieved are 5,372 tons of CO₂ in FY 2017 and 5,392 tons of CO₂ in FY 2018.

POWERING GODREJ INDUSTRIES WITH RENEWABLES

The goal:

We at Godrej Industries Limited and our Associate Companies are looking to save INR 50 million/year with Open Access PPAs. One of our goals is to become a carbon neutral business



The background:

The Godrej Group has been at the forefront of philanthropic and social activities for several decades. Our sustainability strategy, Good & Green, is one of four key imperatives for our business vision. As part of this, since 2011, we have been investing in green and clean technologies at our sites and are moving away from traditional energy sources.

The strategy:

Since 2014, we have used Open Access PPAs for solar and wind power. In phase 1, we have been primarily sourcing green power for our manufacturing facilities in South India due to the lower expenditure on statutory costs, CSS, transmission and distribution losses, AS and electricity duties.

Using strong due diligence, we have signed PPAs with generators for plants in Karnataka, Andhra Pradesh, Tamil Nadu, Madhya Pradesh among others. **In total, we are sourcing close to 35 million kWh per annum.**

We are aggressive on our purchase price, signing PPA tariffs that are, on average, 25 percent lower than the applicable grid tariff. We use both short- and long-term PPAs, depending on the site. The cost of retrofitting is negligible compared to the amount we are saving.

The outcome:

With these arrangements, we are achieving our green goals while substantially reducing our power bills. We save close to INR 50 million (~USD 830k) per annum from our PPAs. The Godrej Group is now sourcing over 51 percent of our energy from renewable sources and has reduced our greenhouse gas emissions by 42 percent from our FY 2011 baseline.

Godrej Tyson Food manufacturing plant in Hoskote, Karnataka procures 100 percent of its power through solar and wind PPAs.



TATA MOTORS: Connecting aspirations towards RE100

The goal:

In 2016, Tata Motors joined RE100 and declared its aspiration to become 100% renewable.

Tata Motors is one of the signatories of RE100, a global collaborative initiative of influencing business committed to 100% renewable electricity, and we aspire to source 100% of our energy from renewable energy source by 2030.



The background:

TATA Motors is committed to reducing its dependency on fossil fuels and to increase the adoption of renewable energy sources through grid and in-house generation. Collaborating with power utilities through short- and long-term renewable energy Power Purchase Agreements (PPAs) for meeting its energy demand is a key part of this. Tata Motors is strongly committed to purchase and use energy efficient equipment, services and eco-friendly technologies.

The strategy:

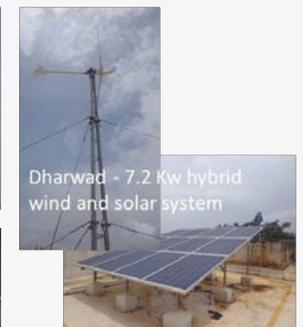
TATA Motors' Climate Change Policy aims to maximize the use of renewable energy and develop action plans to reduce carbon emission for our commercial and passenger vehicle plant operations. Tata Motors constantly endeavours to improve energy efficiency and increase the use of renewable energy by utilizing wind and solar energy through capital investment and PPAs.

As of 31 March 2018, Tata Motors set up in-house renewable capacity (solar and wind) which includes:

- 21.95 MW captive wind power project at Supa and Satara in Maharashtra;
- 2 MW rooftop solar PV installation at Sanand Works;
- 2.1 MW rooftop solar PV installation at Pune Works, work is ongoing for an additional 2 MW installation;
- 2 MW solar PV installation at Lucknow Works;
- 18.5 kWp solar PV installation at Pantnagar Works; and
- 7.2 kW hybrid-wind and solar installation at Dharwad Works.

TATA MOTORS
Connecting Aspirations

We also source offsite wind power at our Pune, Sanand and Dharwad Works through PPAs with third-party wind power generators. We will continue to source renewable power from the grid in line with regulatory policies / frameworks and tariffs in the states where we operate.



The outcome:

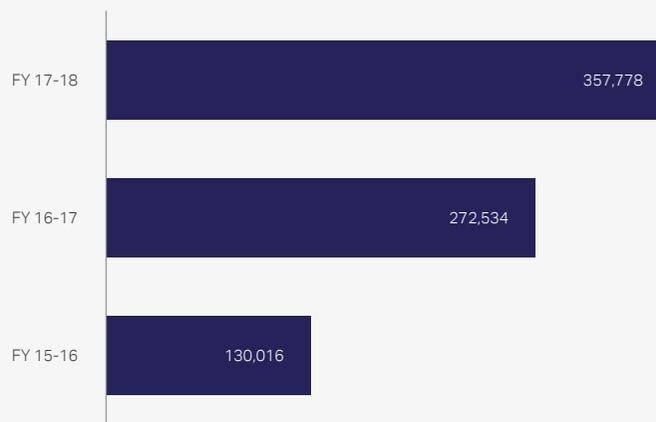
We have achieved a consistent improvement in our efforts on renewable energy. In FY 17-18, Tata Motors generated and/or sourced 99 million kWh of renewable electricity for its manufacturing operations, which contributed to financial saving of INR 66.63 Million. In FY 17-18, through auctioning 13,332 Renewable Energy Certificates, we generated a revenue of INR 12.1 million. Our renewable performance for the past three years is shown here:

Additionally, in the last couple of years, the cost of solar and wind energy has dropped steadily. Governments around the world are supporting renewable energy initiatives through policy and subsidy benefits. Our efforts will definitely intensify in the months and years ahead.

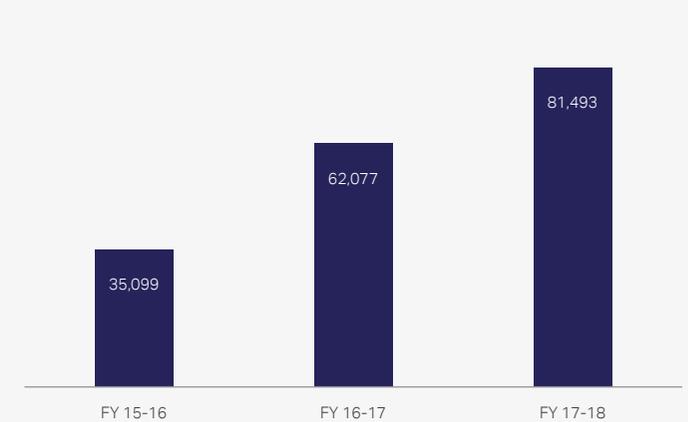
RE as % of total electricity



RE consumed (GJ)



Emission avoided by RE (tCO₂e)



ULTRATECH'S STRATEGIC PROCUREMENT OF RENEWABLE ELECTRICITY

The goal:

Scale up the share of renewable-based power in the energy mix of UltraTech Cement.

The background:

Climate change is one of the key material issues for the business. As such UltraTech has set the long-term aspiration to reduce the impact of climate change through various strategies. Increasing the share of renewable electricity in its portfolio is one of the abatement levers to reduce GHG emissions.

The strategy:

In order to scale up its share of renewable power, UltraTech faced several hurdles including:

- **Regulatory uncertainties:** Lack of enforcement of Renewable Purchase Obligations (RPO); approvals for Group Captive and Open Access; fungibility between solar and non-solar targets.
- **Lack of policy support:** Lack of support regarding power banking provisions; net metering not being applicable for higher capacity and Open Access; clarity on charges and losses in the long-term.

To overcome these hurdles, UltraTech adopted a mixed strategy of onsite generation and offsite third-party procurement to scale up its share of renewable electricity. The company prefers bilateral and group captive projects, while for onsite renewable electricity bilateral contracts with a tenor of 5-25 years are preferred.

The outcome:

The total renewable electricity procured is around 35 million kWh. The total savings are approximately USD \$0.9 to 1 million. The emission abatements achieved are approximately 30,000 to 33,000 tCO₂.



KREATE ENERGY'S RENEWABLE POWER SOLUTIONS: Integrated corporate power procurement strategies

The goal:

Corporate customers often work with power solution providers, intermediaries and trading companies to meet their power requirements from multiple generation sources. This case study highlights how Kreate worked with a large power consumer in India to help the customer lower its cost of power and increase the share of renewable power by revamping the customer's power procurement strategy.

The background:

Kreate Energy (formerly known as Mittal Processors Pvt. Ltd.) is a large real-time power solution provider in India. It has traded more than 50211.90 million kWh since 2009 and traded 460.91 million kWh in the month of April 2018.

A large corporate customer approached Kreate to study its demand pattern and manage its power procurement with plans to reduce power procurement costs while increasing the share of renewable power.

The unique aspect of this project is that even though the customer signed a single contract with Kreate; at the back end, power is being sourced from various wind and solar assets and the procurement options have been strategized based on the customer's power demand profile.

The strategy:

By installing smart meters at the consumer premises, Kreate studied consumption patterns. The smart meter provided data in 15-minute time blocks on a real time basis, which helped Kreate optimize the power procurement strategy.

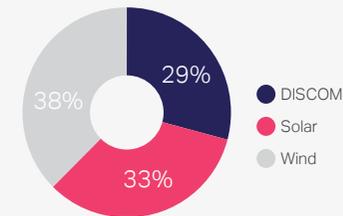
Based on the analysis, Kreate proposed a solution to the client which included diverse sources of power and Open Access routes. It also carried out a risk analysis for the suggested renewable procurement strategy.

Various liaising and contracting services were offered by Kreate to make the renewable procurement process seamless for the client. This included:

- Liaising for credit note adjustments
- Approvals from the local distribution company (R-Infra/TATA)
- PPA execution
- Financial modelling along with billing simulation
- Follow-ups with seller for credit note

Kreate was able to help the company meet almost 60% of its overall power requirement through various renewable energy sources.

Multiple Power Sourcing



Based on this deal, the client has been able to save around INR 500,000 (~USD 7,500) per month.

Tariff Comparison



The outcome:

Kreate has successfully implemented this model in Maharashtra and is preparing to replicate it in other states. This will allow corporate customers in different parts of the country to both increase their share of renewable power and reduce cost, without having to individually liaise with multiple renewable asset owners and power distribution companies.

DILLI HAAT ACHIEVES 98% RELIANCE ON SOLAR POWER

The goal:

The aim of the project is to power Delhi's iconic open-air food and craft market, Dilli Haat, with sustainable energy.

The background:

CleanMax Solar has commissioned a 140 kWp rooftop solar plant across six buildings at the food and craft bazaar, Dilli Haat, in Pitampura, a popular tourist attraction in New Delhi. This project was a part of the 2.5 MW order secured with the Delhi Government's power generation arm, Indraprastha Power Generation (IPGCL).

The project operates on a build-own-operate and maintain (BOOM) model. This means that CleanMax will continue to operate and maintain the project over the PPA tenor and Dilli Haat will procure the renewable power at a tariff determined through the IPGCL tendering process.

The strategy:

Due to the visitor pattern, Dilli Haat experiences a significant load consumption in the evening and night time. Solar energy generation, however, is concentrated during the middle of the day. This timing mismatch between generation and demand for electricity means the project can realize benefits from net metering: Net metering helps the Dilli Haat site, and supports the DISCOM (the electricity distribution company) by providing solar power during daytime, when it's needed in the grid for nearby commercial centers.

Setting up net metering requires an application process and a feasibility analysis. The application is submitted for approval to the local DISCOM and if it meets all requirements, a net metering connection agreement is executed between the DISCOM and the customer. The process took only about a month to complete for the Dilli Haat project, while typically it can take closer to 45 days.

Net metering enabled a larger solar capacity to be installed - in a cost-effective way - and helped to make this renowned tourist destination green and sustainable.



The outcome:

The solar plant is now connected to the grid of TATA Power Delhi Distribution Limited (the local DISCOM). The Dilli Haat project has achieved cost savings of 50% on electricity cost which amount to INR 970,000 per annum. The project has abated 186 tCO₂ per annum.



Glossary

Capacity Utilization Factor: The Capacity Utilization Factor (CUF) is the ratio of the actual electricity generated by a renewable energy project over the year to the equivalent electricity output at its rated capacity over the year.

Captive buyer: The end user of the electricity generated by the captive generating plant.

Captive model: A power asset in which captive buyer(s) consume at least 51 percent of the generated electricity and own at least 26 percent of the equity.

Cess: Cess is a tax typically imposed by the government. It is levied for a specific purpose until sufficient funds have been raised for the stated purpose. For example, after seeking permission from the regulator, a state utility can levy a cess on electricity duty for upgrading of infrastructure or to compensate for a shortfall in revenue.

Commercial Operation Date (COD): The date on which the commercial operation of the power plant begins, after successful testing and injection of power at delivery point (the metering point between the power producer and the utility at the pre-determined voltage level).

Corporate PPA: An agreement between a private company and a power producer (developer, independent power producer, investor) to purchase electricity at a mutually agreed tariff, tenor and capacity.

Net metering: Net metering is a billing mechanism allowing on-site projects to feed excess electricity to the grid, reducing their own electricity bills. It is usually limited to solar rooftop, though some states allow other sources to qualify as well.

Offtaker: The buyer of electricity in a PPA.

Open Access: A regulatory mechanism allowing a grid-connected bulk consumer, having a valid contract demand of 1000 kVA or above, to meet a part or its entire electricity requirements through alternative sources.

PPA: A Power Purchase Agreement is a contract between a power producer and a buyer of electricity, for an agreed tariff, tenor and capacity.

Special Purpose Vehicle (SPV): A subsidiary company with an asset/liability structure and legal status that makes its obligations secure even if the parent company goes bankrupt.

State Electricity Regulatory Commission (SERC): The state electricity regulator. One of their key responsibilities is to determine retail electricity tariffs and Open Access charges.

Tariff: The cost per unit of electricity that a buyer pays.

Utility: Local electricity distribution company.

Relevant business focused initiatives in India

WBCSD's REmobility project in India

The objective of **REmobility** in India is to support corporate adoption of electric vehicles, energy storage and renewable energy. The project will meet these objectives through identification of market barriers, knowledge sharing and collaborations, review of regulatory and policy frameworks, business model innovation and setting up of scalable demonstration projects.

We are working with companies and experts from various parts of the local EV value chain, including original equipment manufacturers, charging infrastructure providers, battery manufacturers, utilities, renewable project developers, ICT providers and corporate end-customers. As of May 2018, over 70 experts and decision-makers from different parts of the EV value chain, including some institutional partners and end-customers, have agreed to share time and expertise to help meet our common objectives.

To know more, or to join the project, please contact:

Jasmeet Khurana

Manager, Climate & Energy
khurana@wbcsd.org

Other initiatives in India

RE100 is a collaborative, global initiative uniting influential businesses committed to 100% renewable electricity, working to massively increase demand for - and 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 who are accelerating the transition to a zero-emissions economy by committing to 100% renewable electricity across their operations. Globally, 125 multinational businesses have made the RE100 commitment by February 2018.

Contact:

Shailesh Telang

Technical Manager (Renewable Energy),
CDP India,
shailesh.telang@cdp.net

Atul Mudaliar

Program Manger, The Climate Group
amudaliar@theclimategroup.org

RE 100

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 the government agencies and other relevant institutions to help member companies voluntarily set and achieve their renewable energy goals.

Contact:

Deepak Krishnan

Manager, Energy Program,
World Resources Institute India
DKrishnan@wri.org

Ravi Chander Rangavajjula

Principal Counsellor,
Confederation of Indian Industry
ravi.c@cii.in

 **GREEN POWER MARKET
DEVELOPMENT GROUP**

Renewable Energy Demand Enhancement

(REDE) initiative aims to build an alliance among corporate buyers (Commercial & Industrial consumers) to increase commitment towards RE procurement and catalyze solutions to address challenges that are significantly restricting demand. By means of developing an appropriate interface between buyers, suppliers and policymakers, the initiative intends to create a cohesive and informed market to meet the corporate RE demand. REDE is built on the success of Renewable Energy Buyers Alliance (REBA) founded in June 2016 in USA.

Contact:

Bhavna Prasad

Director – Sustainable Business, WWF-India
bprasad@wwfindia.net

Shuva Raha

Deputy Director and Head – New Initiatives, CII
shuva.raha@cii.in



²² The 3.5 TW figure is based on the International Energy Agency's 2° scenario

Acknowledgements

WBCSD's Corporate Renewable PPA Forum in India has brought together companies along the entire renewable value chain to collaboratively develop this report. We thank the following people for their contributions and thought-leadership:

ACCIONA: Bhargava Sharma

ACC (member of LafargeHolcim): Vikas Soni

CLP: Dipjay Sanchania

EDEN-RE: Vivek Kodesia

Hero Future Energies: Raghunath Mahapatra

KPMG: Anvesha Thakker & Jatin Babbar

Schneider Electric: Devesh Singh

Tata Cleantech Capital: Arunavo Mukerjee

This report was drafted by WBCSD with chapters contributed by IFC, CLP, EDEN-RE, Tata Cleantech Capital and Trilegal. The chapter contribution by IFC was through a report, "Assessment of parity driven solar PV market in India", developed by Bridge to India. It has been prepared for general informational purposes only. It is not intended to be relied upon as accounting, tax, legal or other professional advice. The data shown in the report has been provided to our best knowledge, however, its complete accuracy can't be guaranteed.

We thank the following co-authors:

Bridge to India: Mudit Jain & Vinay Rustagi

CLP: Dipjay Sanchania

EDEN-RE: Vivek Kodesia

Tata Cleantech Capital: Arunavo Mukerjee

Trilegal: Neeraj Menon, Amit Maheshwari & Mehga Kaladharan

This work was funded by WBCSD member companies, with additional support from We Mean Business, and IFC.

About IFC

IFC - a sister organization of the World Bank and member of the World Bank Group - is the largest global development institution focused on the private sector in emerging markets. We work with more than 2,000 businesses worldwide, using our capital, expertise, and influence to create markets and opportunities in the toughest areas of the world. In FY17, we delivered a record \$19.3 billion in long-term financing for developing countries, leveraging the power of the private sector to help end poverty and boost shared prosperity. For more information, visit www.ifc.org.

About We Mean Business

We Mean Business is a global nonprofit coalition working with the world's most influential businesses to take action on climate change. Together we catalyze business leadership to drive policy ambition and accelerate the transition to a low-carbon economy. Our mission is to ensure that the world economy is on track to avoid dangerous climate change by 2020 while delivering sustainable growth and prosperity for all.

The Corporate Renewable PPA Forum in India currently includes of the following companies:



WBCSD's Corporate Renewable PPA Forum in India has been operating for the past 18 months. Over this period, many companies and organizations participated in the workshops and webinars and / or provided a case study on corporate procurement in India. We thank the following people for their special contributions:

Acciona: Guadalupe Vázquez González

Ambuja Cement (member of LafargeHolcim): Ashish Gupta

Cleanmax Solar: Rahidka Bhadada

CLP: Dipjay Sanchania & Manish Verma

EDEN-RE: Vivek Kodesia & Prabir Mohanty

EY: Shuaib Kamili

Godrej: Prasad Jakkaraju & Vikas Goswami

Idea Cellular Ltd.: Jacob Mathew and Pratik Ghosh

IFC: Sivaram Krishnamoorthy

KPMG: Anvesha Thakker & Priyajit Ghosh

Kreate: Manoj Vyas

Mahindra Susten: Arun Bharti

Tata Cleantech Capital: Arunavo Mukerjee

Tata Motors: Arvind Bhodhankar & Debiprasad Chatterjee

Tech Mahindra: Damodhar Reddy & Syed Ateeq

Trilegal: Neeraj Menon

Ultratech: Vishal Bhavsar

Vedanta Power: Ajay Dixit

WRI: Deepak Sriram Krishnan

WBCSD's REscale business solution

Through **REscale**, leading companies are working together on solutions to accelerate the deployment of renewables beyond average growth and transition to a low-carbon electricity system. The group shares the view that renewable energy is reliable and increasingly competitive, and that 3.5 TW of capacity can be deployed by 2025.²²

In 2016, REscale published the report "[Corporate Renewable Power Purchase Agreements: Scaling up globally](#)" that guides companies through the process of procuring renewable power via Power Purchase Agreements (PPAs). This report continues our work focusing on key growth markets to increase awareness, understanding and use of Corporate Renewable PPAs. The platform undertaking this work is called the global Corporate Renewable PPA Forum.

To find out more about REscale, the global Corporate Renewable PPA Forum and previous reports, visit our [website](#).

To contact WBCSD about REscale:

Mariana Heinrich

Manager, Climate & Energy
heinrich@wbcsd.org

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, representatives from our member companies and other stakeholders participating in the Corporate Renewable PPA Forum in India, under WBCSD's [REscale project](#).

A wide range of companies and organizations reviewed the material, thereby ensuring that the document broadly represents the majority view of the Corporate Renewable PPA Forum. It does not mean, however, that every company or organization within the forum agrees with every word.

To contact WBCSD about this report:

Jasmeet Khurana

Manager, Climate & Energy
khurana@wbcsd.org

WBCSD runs programs for business in India in water, agriculture, electric mobility, cement and more. For information:

Joe Phelan

Director, WBCSD India
phelan@wbcsd.org

About 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. www.wbcsd.org

Follow us on [Twitter](#) and [LinkedIn](#)

**World Business Council
for Sustainable Development**

WBCSD India
4th Floor, Worldmark 2, Aerocity
New Delhi, 110037, India

WBCSD Secretariat
Maison de la Paix
Chemin Eugène-Rigot 2B
CP 2075, 1211 Geneva 1 Switzerland

www.wbcd.org

