ICRA

Indian Renewable Energy Sector

Strong growth prospects for renewables in C&I market with preference for group captive

March 2023

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Executive Summary

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RE capacity requirement from the C&I segment is estimated to be large at ~80 GW considering 20% of the demand is met through RE by 2030.

Implementation of Green Open Access rules notified by the Ministry of Power remains slow with only state notifying the regulations in line with the rules so far.

Demand prospects for renewable energy (RE) capacity in the commercial & industrial (C&I) segment remain strong, given the superior tariff competitiveness and growing sustainability initiatives by C&I players to meet their energy requirements through renewables, going forward.

The C&I segment accounts for about 40-45% share in all-India energy demand. Even assuming 20% of the energy requirements are to be met by C&I segment through renewables, the RE capacity requirement is estimated to remain significant at close to 80 GW. While the discoms are offering green tariffs to the C&I customers, the tariffs remain higher than the regular grid tariff and uncompetitive against the tariffs offered by RE IPPs.

The tariffs charged by discoms to industrial consumers vary between Rs. 6-8/unit across the states for FY2023, and has shown an increase over the previous year, with the rising cost of power supply. This apart, the consumers have to bear the fuel & power purchase adjustment (FPPCA) charges based on the actual power purchase cost (PPC) incurred by the discoms. The cost of supply for the discoms is under upward pressure owing to the rising PPC due to higher use of imported coal and rise in short-term tariffs.

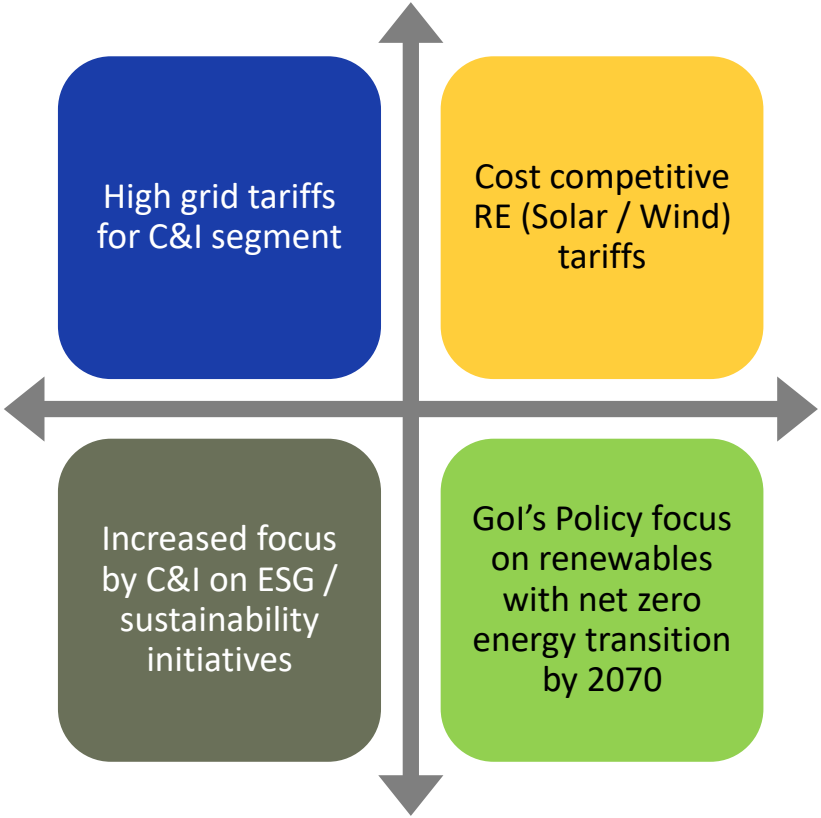
The cost of sourcing of RE power through open access remains at a discount to grid tariffs after factoring the applicable open access charges in most states, with few exceptions like Andhra Pradesh and Maharashtra due to imposition of high cross-subsidy surcharge (CSS) and additional surcharge (AS). Nonetheless, sourcing of RE power is economical through the group captive route in such states.

The regulatory risk remains inherent for open access-based RE projects, due to dependency on open access approvals, charges and banking requirements. The open access and banking charges/norms vary widely across the states. Within the open market, the regulatory risk is relatively lower for group captive projects compared to the projects selling power through third party PPA route, given the exemption from CSS and AS.

The Ministry of Power notified the Green Open Access rules in June 2022 with the objective to bring a common methodology for open access charges and to set up a central nodal agency for single window open access system. However, the adoption of the rules remains slow with the SERC in only one state notifying the regulations in line with the rules so far.

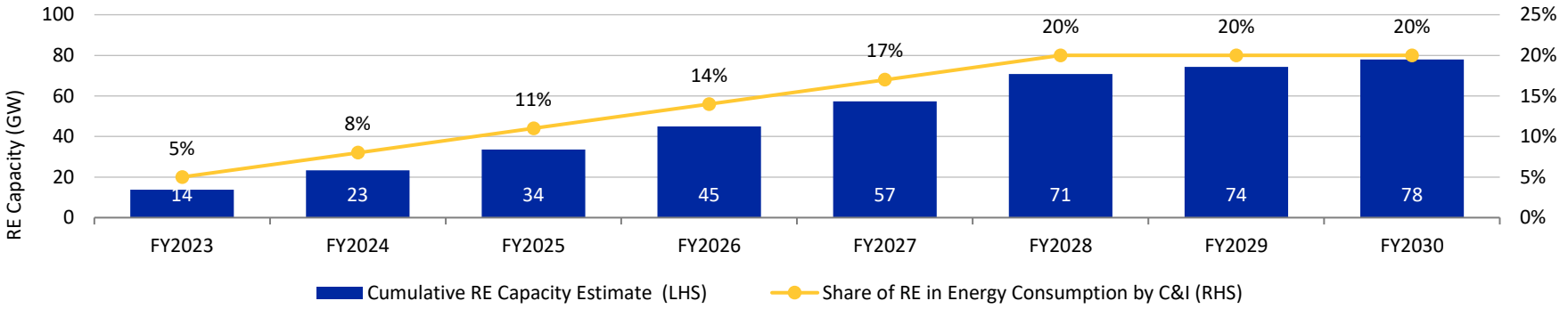
Demand Drivers & RE Capacity Estimates in C&I Market

Strong demand drivers for RE adoption in the Commercial & Industrial segment



RE capacity addition requirements remain significant in C&I segment

Exhibit: RE Capacity Estimates / Requirements in C&I segment



Source : ICRA Research; RE PLF assumed at 25.0% for the capacity assessment

Electricity demand in India at 1,380 billion units in FY2022; CAGR (10 year) @ 4%

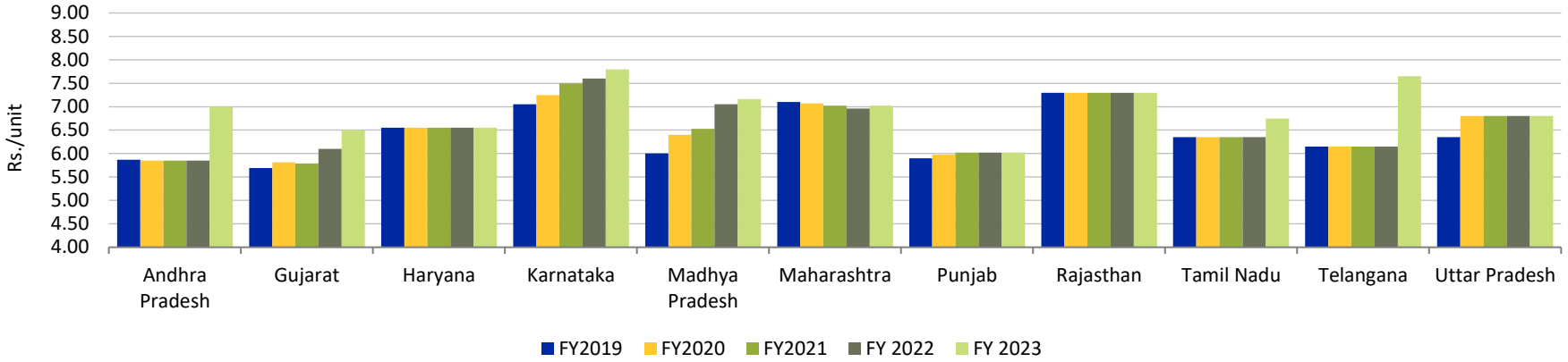
C&I segment accounts for 40-45% of the electricity demand in India

Even assuming 20% of C&I demand is met through RE by 2030, RE capacity requirement is estimated at 78 GW

Outlook on HT Industrial Tariff & Cost of Power Supply for Discoms

HT industrial tariffs on the rise in key states, given the upward pressure on cost of power supply for the discoms

Exhibit: Trends in HT – Industrial Tariffs (Energy Charge) for the Discoms in Key States



Source : ICRA research, Tariff orders issued by State Electricity Regulatory Commission (SERC) for the discoms in the respective states

- As seen above, energy charge applicable in HT industrial tariff as approved by the SERCs in various states in FY2023 vary between Rs. 6-8/unit and has shown an increase over the previous year, with the rising cost of power supply.
- Over and above the energy charge component of the tariff, fuel & power purchase cost adjustment (FPPCA) is applicable. Wherever the same is not implemented effectively by the discoms, HT tariffs are likely to increase further due to true-up of such cost increase at the time of the annual tariff determination. Going forward, as and when SERCs notify their regulations in line with amended electricity rules for FPPCA dated December 2022, discoms will also be required to implement the same and pass on FPPCA in a monthly manner.

Rise in coal imports amid elevated international coal prices, exert pressure on cost of power procurement for discoms

Exhibit: Trends in Indonesian coal price index (HBA)

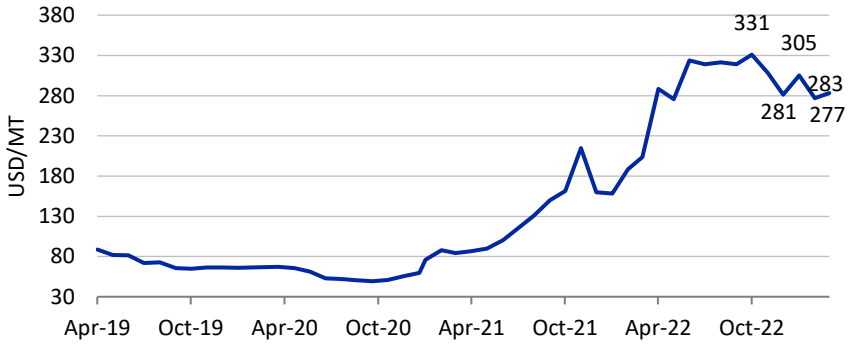
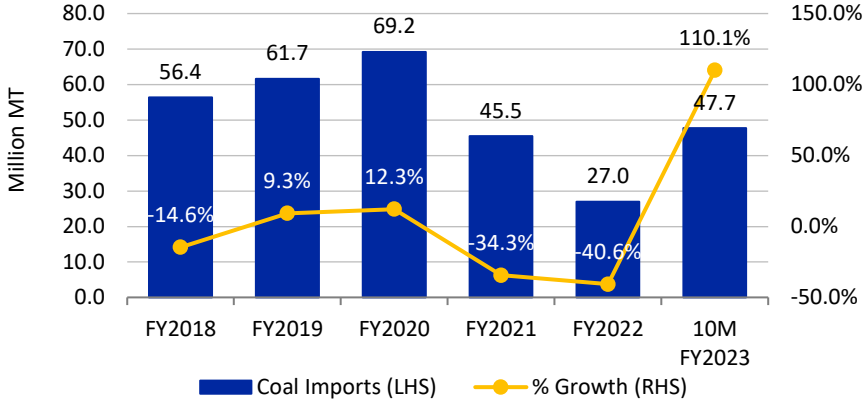


Exhibit: Trends in coal imports by power utilities at all India level



Source: ICRA Research, Central Electricity Authority (CEA)

- Coal prices remain elevated, despite the recent dip from the peak.
- Higher demand for coal from China as well as from India recently.
- There is higher demand from Europe, led by a shift away from Russia for coal and gas requirements amid the Ukraine-Russia war.

- Coal imports by power utilities increased by 110% on a YoY basis in 10M FY2023 amid the strong recovery in electricity demand and following the MoP directive in May '22 to domestic coal-based power plants to import and blend coal and for imported coal-based units to operate under the fuel cost pass-through arrangement. This, along with higher tariffs in the short-term market, is leading to an upward pressure on cost of power procurement for the discoms.

Regulatory Landscape & Viability Assessment for Open Access-based RE Projects

Open access charges – applicability

Sale of power under the open access route first introduced under the Electricity Act, 2003, allowing non-discriminatory use of transmission and distribution infrastructure of the discoms by consumers with demand > or = 1 MW for procuring electricity from the source of their choice (power generators, traders or exchange).

Power under the open access route can be sold via a) third-party offtake mode, which involves sale of power typically to C&I customers by signing a PPA or b) captive/group captive mode wherein the customer holds a minimum of 26% share and consumes a minimum of 51% of generated power.

Open Access Charges	=	Cross Subsidy Surcharge (CSS)	+	Additional Surcharge (AS)	+	Transmission & Wheeling Charges (In cash & In kind / % terms)
		To compensate the discoms for the loss of cross subsidy from high tariff-paying industrial and commercial consumers. This is not applicable for captive/group captive projects.		*To meet the fixed cost obligation of the distribution utilities with respect to the stranded generation capacity due to open access availed by such consumers.*		

Cross-subsidy surcharge varies widely across the key states for open access projects

Exhibit: Cross subsidy surcharge for FY2023 across key states for open access based RE projects

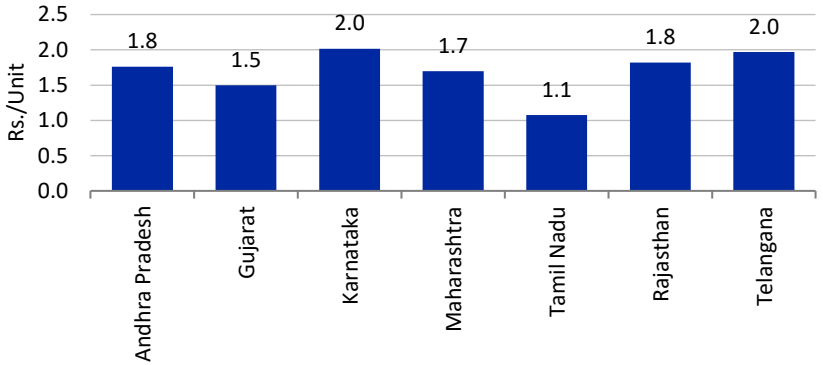
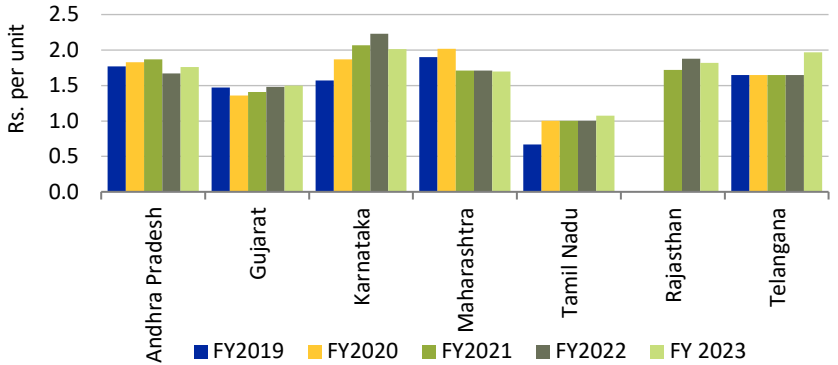


Exhibit: Trend in cross subsidy surcharge levied across key states for open access based RE projects



Source: ICRA Research, Orders by SERCs

- CSS varies widely between 1.1 to 2.0 Rs./unit as observed across the key states, with the removal of concessions / exemptions by the SERCs – which were earlier available for RE projects in third party open access route. The CSS increased significantly for RE projects in states like Karnataka and Rajasthan among the key states. Overall, CSS remains exposed to an upward pressure arising out of the increase in the cost of power supply for the distribution utilities. It is also observed that the CSS estimate by the SERCs based on applicable formulae of calculation of CSS in the regulations is higher (> 20% of billing rate) in most cases, however, the same is capped at 20% of the billing rate.

Additional surcharge applicable for RE projects also varies widely, across key states

Exhibit: Additional surcharge for FY2023 in key states for open access based RE projects

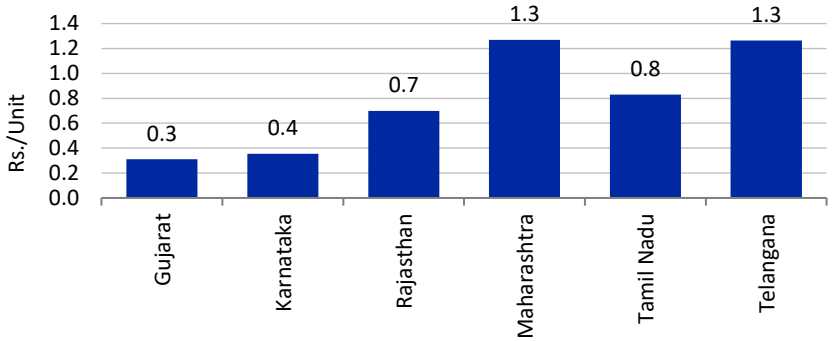
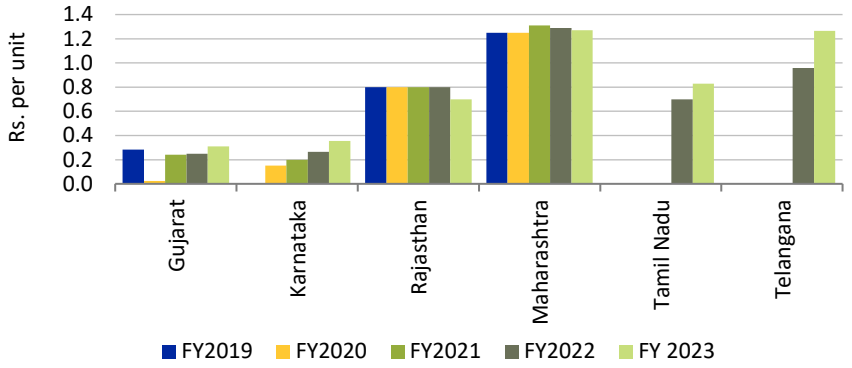


Exhibit: Trend in additional surcharge levied in key states for open access projects

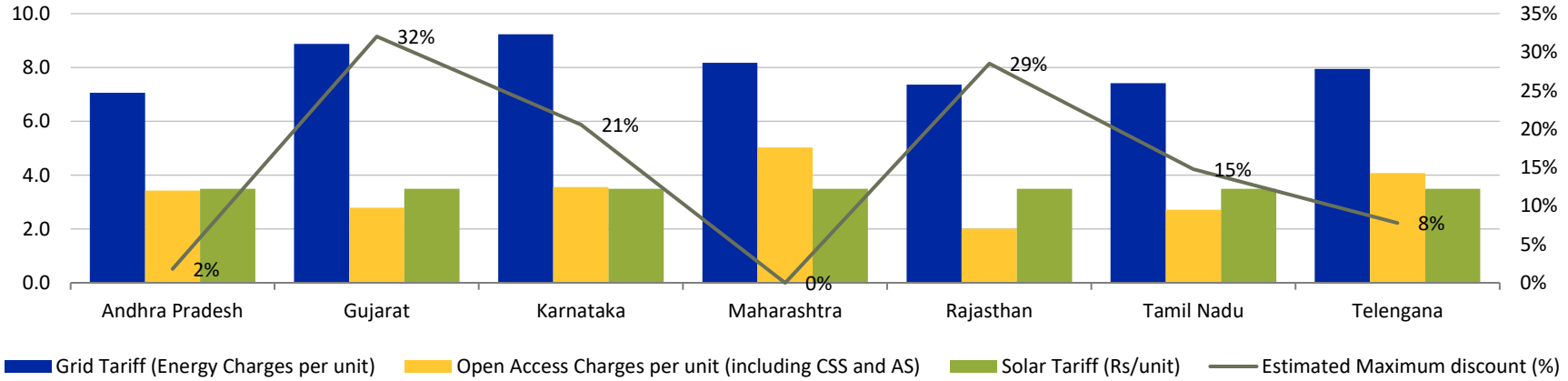


Source: ICRA Research, Orders by SERCs

- In addition to CSS, additional surcharge (AS) has also been in place in most states for third party open access-based RE projects, and the same varies widely between Rs. 0.3 to 1.3/unit, with increasing trend seen across the states. Further, AS remains exposed to an upward pressure arising out of the increase in the cost of power supply for the distribution utilities.
- In line with Green Energy Open Access Rules dated June 2022 by Ministry of Power, GoI, additional surcharge is not applicable for Green Energy Open Access, if the fixed / demand charges are paid by the open access consumer. Notification of such rules by the SERCs in line with the policy rules dated June 2022 is still awaited in most states.

Viability for C&I PPAs in 3rd party sale route; group captive segment preferred

Exhibit: Estimates of discount that can be provided by solar power projects in key states for solar tariff at Rs. 3.5/unit



Source : ICRA Research

- Despite the various challenges, the sale of power under open access remains attractive for the IPPs in some of the key states like Gujarat, Karnataka, Rajasthan and Tamil Nadu. Maximum discount that can be offered by the IPPs thus varies between 15 to 30% assuming net tariff of Rs. 3.5/unit. However, the sale via open access remains uneconomical in states such as Andhra Pradesh, Telangana and Maharashtra. Nonetheless, the developers and C&I customers can explore the captive route in these states, due to exemption of cross-subsidy surcharge & additional surcharge.
- In case of group captive structures, additional surcharge and cross subsidy surcharge are exempt – resulting in a significant reduction in the applicable grid / open access charges. As a result, regulatory risk is relatively lower and tariff competitiveness also improves from the off-takers' (C&I) perspective.

Viability assessment (Illustrative – Group captive solar SPV)

Exhibit: DSCR Sensitivity (Illustrative) for Group Captive SPV

Cumulative DSCR		Interest Rate					
		9.00%	9.25%	9.50%	9.70%	10.0%	10.25%
Variation against base case PLF	+10%	1.32	1.31	1.30	1.29	1.27	1.26
	+5%	1.26	1.25	1.24	1.23	1.22	1.21
	0%	1.20	1.19	1.18	1.17	1.16	1.15
	-5.0%	1.14	1.13	1.12	1.12	1.10	1.10
	-10%	1.08	1.07	1.06	1.06	1.04	1.04
	-15%	1.02	1.01	1.00	0.99	0.98	0.97

Source: ICRA Research; Debt and equity ratio of 70:30, interest rate of 9.5% with repayment tenure of 18 years post COD, DC plant load factor (PLF) of 17.0%, and degradation factor of 0.7% per year, O&M cost of Rs. 4 lakh per DC MW with annual escalation of 5.0%, PPA Tariff at Rs. 3.6/kwh; Project cost : Rs. 4.5 Cr./MW; PPA tenure – 25 year; Group Captive Ownership : 26% by Off-taker & 74% by SPV

- Cumulative DSCR as shown above remains sensitive to interest rate and PLF movement, given the fixed & single part nature of PPA tariff. For 100 bps increase in interest rate, the impact in cumulative DSCR is estimated at about 5-6 bps
- PPA tariff is fixed throughout the PPA tenure (25 year) and is exclusive of grid / open access charges and taxes or levies if any. For the off-taker, the landed cost of power is the sum of PPA tariff and grid charges

Key terms of PPAs for C&I - RE projects

Projects typically use discom/transco network in this mode; More preference seen by large industrial customers for onsite / group captive projects …

While PPA tenure have been seen up to 20-25 years, PPA lock-in period is typically for a lower period, like 5-15 years. Nonetheless, an increasing trend in lock-in period is being observed

Landed tariff is at a discount to the grid tariff and would be typically capped at the grid tariff; provisions for pass-through of change in law events like imposition of new charges or revision in open access charges; Delivery point in many PPAs is specified as generation terminal

Minimum contracted off-take by buyers & supply by sellers along with deemed generation clause; Shortfall generation / supply penalty specified in the PPA

Termination penalties during lock-in period linked to present value of revenues foregone due to PPA termination or a pre-agreed buy back value; specified year-wise in PPAs as well in many PPAs

Policy Initiatives

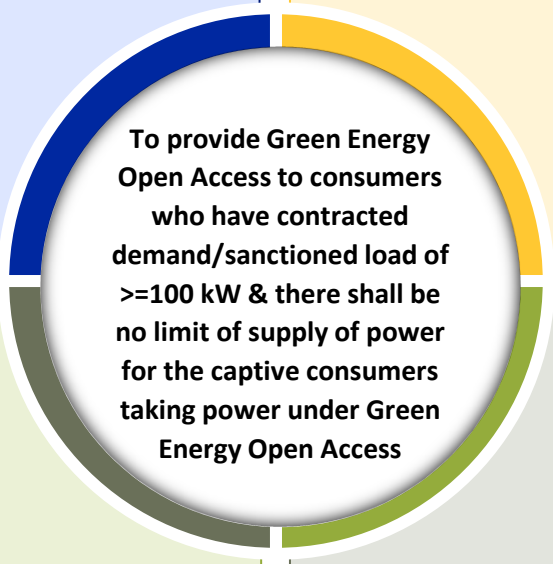
MoP notified Electricity Rules, 2022 (Promoting Renewable Energy Through Green Energy Open Access) : June 2022

These rules shall be applicable for generation, purchase and consumption of green energy through open access

Uniform Renewable Purchase Obligations (RPOs) should be applicable on all obligated entities in area of a distribution licensee

A central nodal agency shall be set up by the Central Government to set up and operate a single-window Green Energy Open Access system for renewable energy

All applications for Green Energy Open Access shall be submitted on the **portal set up by the central nodal agency**



A common methodology for calculation of open access charges and banking charges shall be prepared by a forum of regulators within four months from the notification of these rules. The charges should not be onerous and should meet the prudent cost of distribution licensee

Banking shall be permitted at least on a monthly basis. Permitted quantum of banked energy shall be at least 30% of the total monthly consumption of electricity

Additional surcharge shall not be applicable for Green Energy Open Access consumers

These rules are positives for the developers and C&I customers, given the reduction in minimum sanctioned load for open access, a common methodology for computing open access charges, provision for banking and exemption from additional surcharge

Source: Ministry of Power; Commencement Date of these rules - June 06, 2022

Amendments in Green Energy Open Access rules dated January 2023

Banking of Energy : The credit for banked energy shall not be permitted to be carried forward to subsequent banking cycles and shall be adjusted during the same banking cycle; The un-utilised surplus banked energy shall be considered as lapsed at the end of each banking cycle and the RE developer shall be entitled to get Renewable Energy Certificates (RECs) to the extent of the lapsed banked energy.

Applicability of CSS and AS : Cross-subsidy surcharge and additional surcharge shall not be applicable in case of power produced from a non-fossil fuel-based waste-to-energy plant is supplied to the open access consumer. Additional surcharge shall not be applicable in case electricity produced from offshore wind projects, which are commissioned up to December 2025 and supplied to the open access consumer.

Standby Charges : The standby charges, wherever applicable, shall be specified by the SERC and such charges shall not be applicable, if the Green Energy Open Access consumers have given notice, in advance at least a day in advance before closure time of the day ahead market i.e., on (D – 1) day, 'D' being the day of delivery of power for standby arrangement to the distribution licensee.

Source : Ministry of Power, ICRA Research

Policy rules on Green Energy Open Access dated June 2022, are yet to be adopted and notified by SERCs across the states. The SERC in Karnataka has recently notified the final regulations, while the SERC in Punjab and joint SERC for Mizoram & Manipur have notified the draft regulations as of now. As a result, notification of the regulations by SERCs in line with policy rules in a timely manner and subsequent implementation, remains a key monitorable.

Rating Trends in C&I PPA – RE IPPs

Rating distribution and trends in upgrade and downgrade for RE IPPs (C&I PPA-based)

Exhibit: Rating distribution for RE IPPs in C&I market

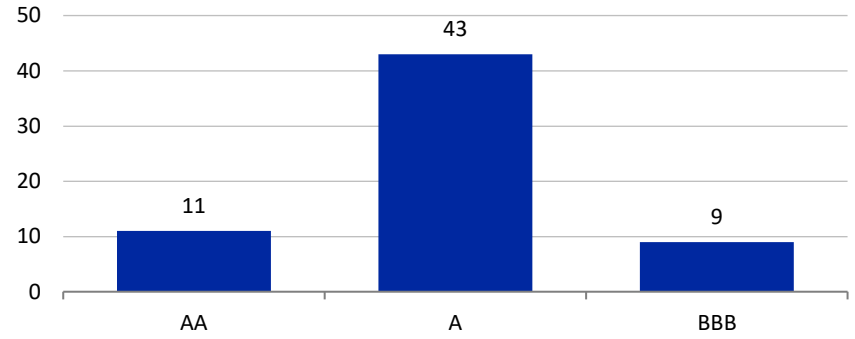
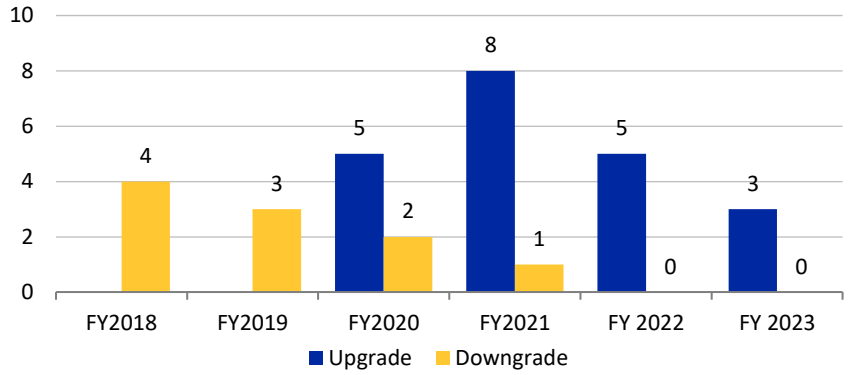


Exhibit : Trend in upgrades and downgrade for RE IPPs in C&I market



Source : ICRA Research

- ICRA's rated portfolio in the open access C&I market constitutes 63 entities (third party sale + group captive) having aggregate generation capacity of ~1,600 MW. This constitutes group captive PPA-based capacity of ~73% and balance being third-party sale-based PPAs.
- Ratings in AA category mainly pertain to the entities with strong parentage, besides the standalone credit strengths. Overall, credit ratio in this segment has seen a favourable trend, with minimal downgrades. Rating upgrades in the portfolio have been mainly supported improvement in the credit profile of parent, growing operating portfolio and demonstration of track record. The downgrades for few entities in the past period have been due to factors such as deterioration in the generation profile, weak liquidity profile as well as deterioration in the parent's credit profile.
- Overall credit profile of the RE IPPs in the C&I market is supported by a mix of reasons such as strong promoter backing, availability of PPAs with creditworthy C&I customers, an established operational track record in a few cases and adequate liquidity buffer in the form of Debt Service Reserve Account (DSRA).

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Thank You!