Exploring Virtual Power Purchase Agreements (VPPA) for increasing RE penetration in Commercial and Industrial (C&I) segment of India

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Disclaimer: The views presented in this presentation are personal and reflect only author's opinion on the subject

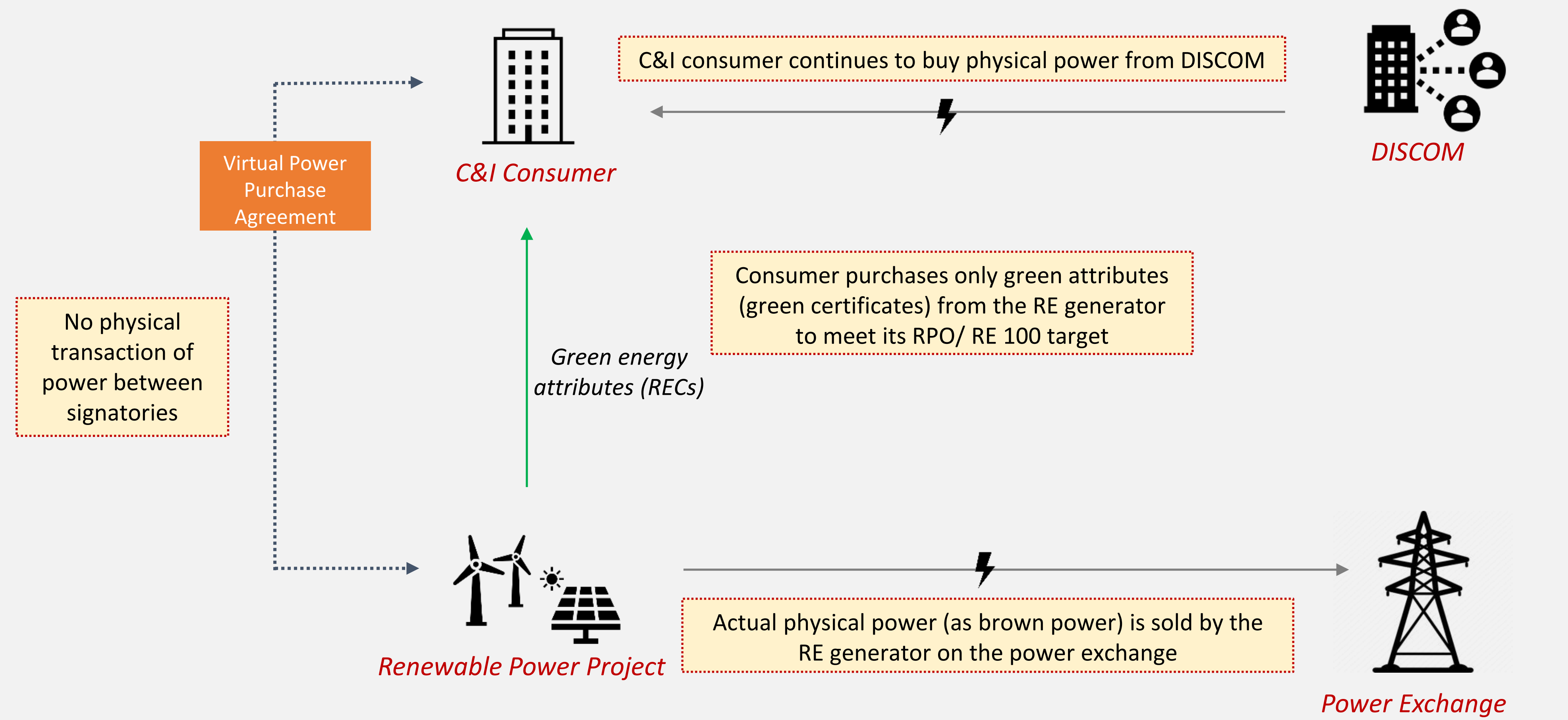
Objective

To explore a new renewable energy (RE) procurement mechanism specifically for commercial and industrial (C&I) customer, which would:

- Support India in meeting the 2030 RE target through increased RE deployment
- Help the C&I customer in meeting their renewable purchase obligation (RPO) and sustainability targets, without DISCOMs losing revenue coming from their high paying customers
- Provide RE developers with a firm source of revenue, minimizing their risk in capacity development
- Increase the quantum of power transacted on the power exchange
- Address some of the bottlenecks/risks of existing RE procurement mechanisms

Introducing VPPA (1/2)

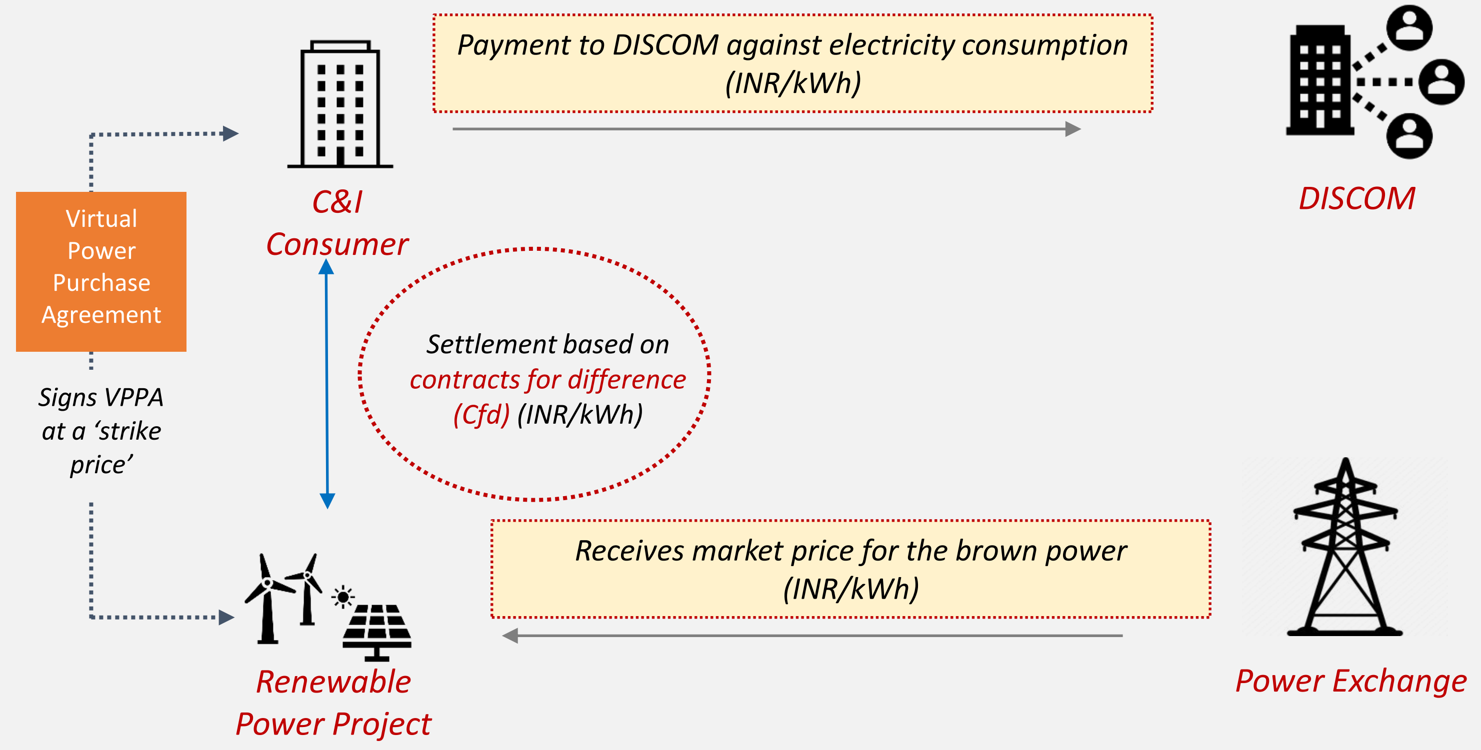
VPPA Operating Mechanism



RPO: Renewable Purchase Obligation
REC: Renewable Energy Certificates

Introducing VPPA (2/2)

VPPA Payment Settlement Mechanism



CfD: Any difference in Market Price and Strike Price to be settled between RE Developer & Consumer

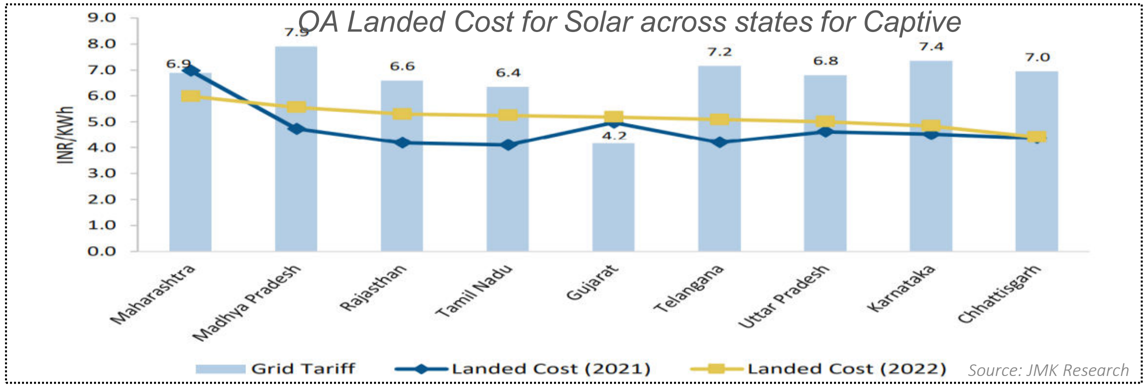
Relevance

- *Limited uptake of existing mechanisms due to various issues (1/2)*

Open Access

OA landed cost (2022) > OA landed cost (2021) because of:

- Rising project costs affecting the base tariff
- Increase in OA charges

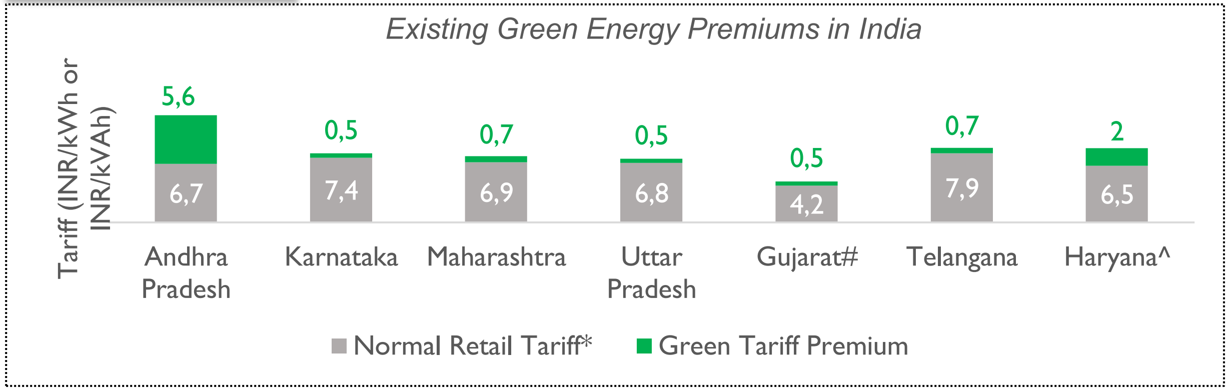


Few challenges related to OA:

- **Policy risk:** Compliance to various state regulations for C&I consumer is challenging at times – esp. when consumer is located in various states.
- **Financial risk:** Uneconomical at times due to high open access charges like additional surcharge and cross subsidy surcharge.
- **Delay in getting open access approvals**

Green Tariff

- Andhra Pradesh – first state to introduce green tariff in 2008
- Green tariff is priced higher than the conventional retail tariff with premium ranging from INR 0.5-5.55/kWh



Few challenges related to 'green tariffs' :

- **Limited supply of RE**: Green energy tariff is subject to the availability of surplus renewable power with the DISCOMs
- **Green tariffs are at a premium to the regular grid tariffs**: This is in addition to fixed charge already being paid by the consumer
- **Regulatory barrier for consumer with RE 100 target:** RE consumed by a consumer in excess of its RPO obligation is counted towards RPO compliance of DISCOM.

**Retails tariffs are for industrial consumers connected at 33 kV voltage, and include only energy charges*
 # In Gujarat, green tariff premium is only relevant in the Deendayal Port Trust (DPT) licensee area
^ INR 2/unit is the premium for solar energy for Haryana. For Non-solar, it is INR 1/unit

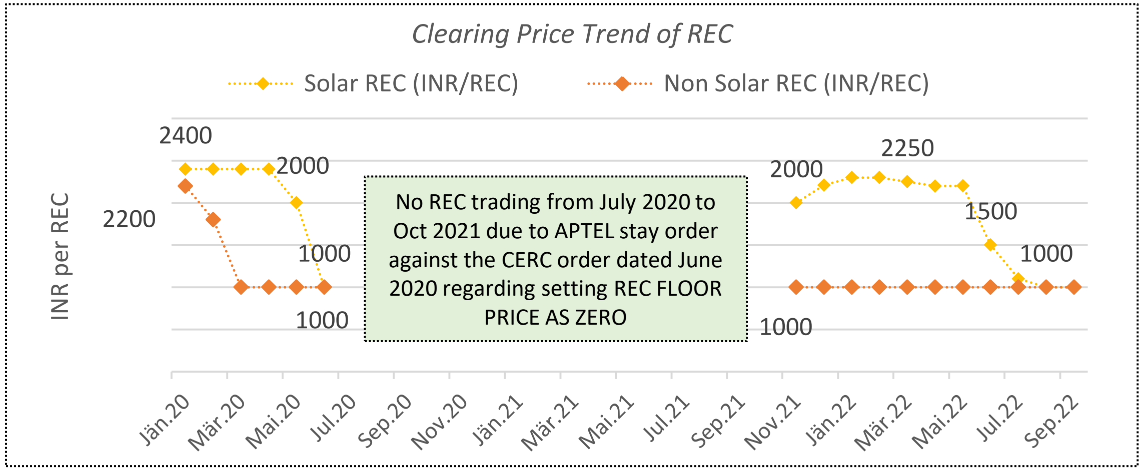
Relevance

- *Limited uptake of existing mechanisms due to various issues (2/2)*

Jan 2020: Supply side constraints leading to high prices of solar and non-solar RECs

July 2022: Increased inventory of RECs saw the clearing price for both solar and non-solar REC reaching floor-level

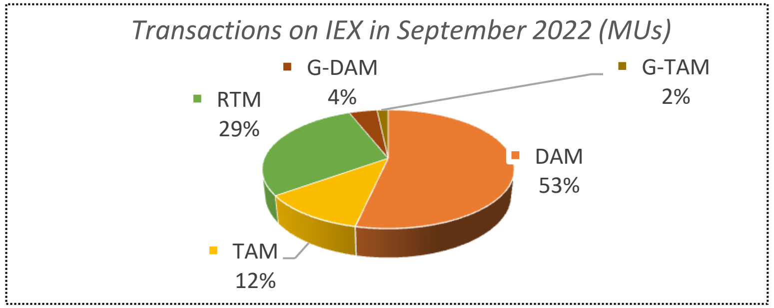
REC



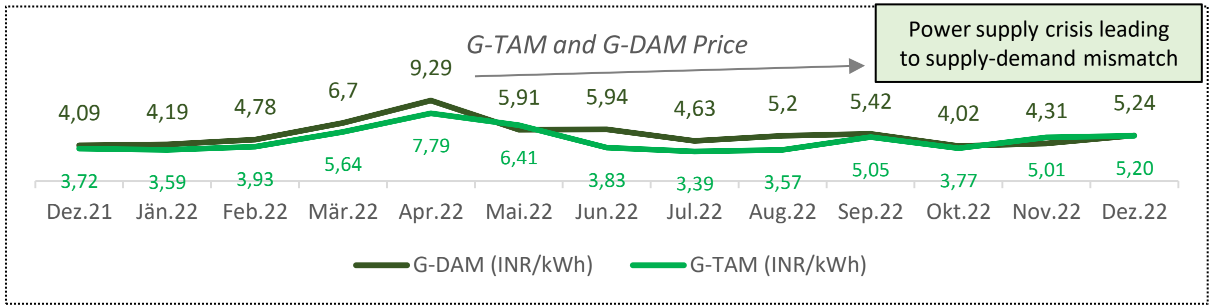
Few challenges related to REC:

- **No price certainty:** REC price discovery is dependent on market volatility
- **No volume certainty:** Supply and demand crunches. Only 4% of India's renewable power capacity is registered under the REC scheme.

G-TAM/G-DAM



Share of G-TAM and G-DAM in IEX is only 6%



Few challenges related to G-TAM/G-DAM:

- **No price certainty:** Clearing price of green power is dependent on market volatility
- **No volume certainty:** Supply and demand crunches.

DAM: Day-Ahead Market
TAM: Term-Ahead Market
RTM: Real-time Electricity Market
G-DAM: Green Day-Ahead Market
G-TAM: Green Term-Ahead Market

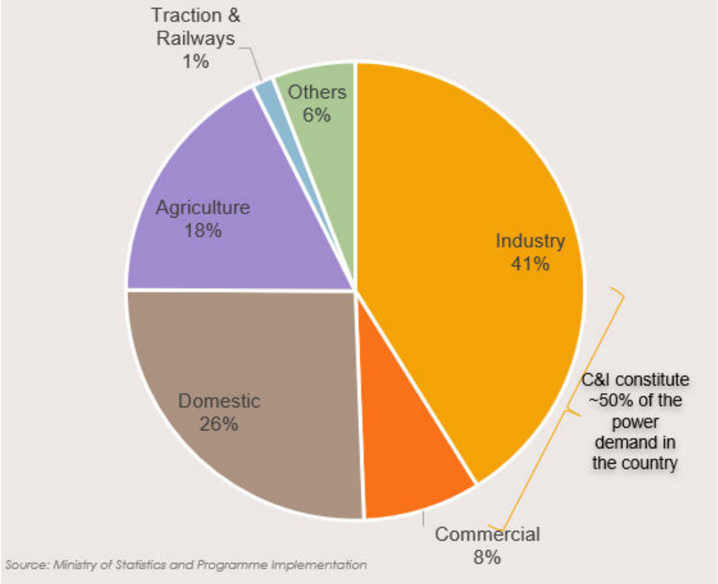
Benefits of VPPA for India (1/2)

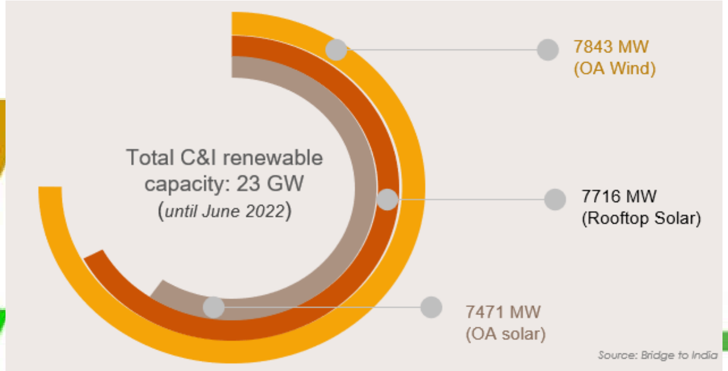
- *VPPA can address the challenges in the existing RE procurement mechanisms*

S. No.	Procurement mechanism	Existing Issues	How VPPAs can address this issue
1	Open Access	C&I consumers with offices/plants across different locations are required to sign multiple PPAs under OA regime	VPPA can aggregate demand of multiple users across different geographies under one contract since there are no obligations for off-taking of physical power under VPPAs
2		Challenges in meeting compliance of open access (OA) regulations across various states	The consumer is not impacted by various OA regulation and charges
3		Uncertainty in OA charges makes existing PPAs unviable	
4		Resistance from DISCOMs in getting OA approvals for shifting to a third-party source	Since the consumer continues to procure power from the distribution utility, VPPAs are not seen as a threat to the utility business
5	REC and Power Exchange	Purchase of RE power and RECs from the power exchange is prone to market fluctuation with market clearing price varying with demand and supply	VPPAs provide a firm revenue to the RE developer and is immune to market volatility of demand and supply. The developer is already aware of the quantum to be supplied to the consumer.
6	Power Exchange	Merchant RE plants face difficulty in getting the funding due to uncertainty in revenue stream	VPPAs provide a firm revenue to the RE project developer for the contract duration
7	REC	C&I Consumers/Corporates are required to establish that they are adding new renewable energy to the grid under their sustainability goals, but current RECs do not assign back to any project making it difficult for consumers to prove additionality	VPPAs allow the consumer to assign green certificates to a particular project
8	Green Tariff	Supply of green energy to consumer at a premium is subject to the availability of surplus renewable power with the DISCOMs	RE developer directly supplies the green attribute to the consumer as per the VPPA signed.

Benefits of VPPA for India (2/2)

- *VPPA can also provide additional advantages…*





VPPA will help in meeting India's 2030 RE target

VPPA will help the RE developer to get a firm revenue stream

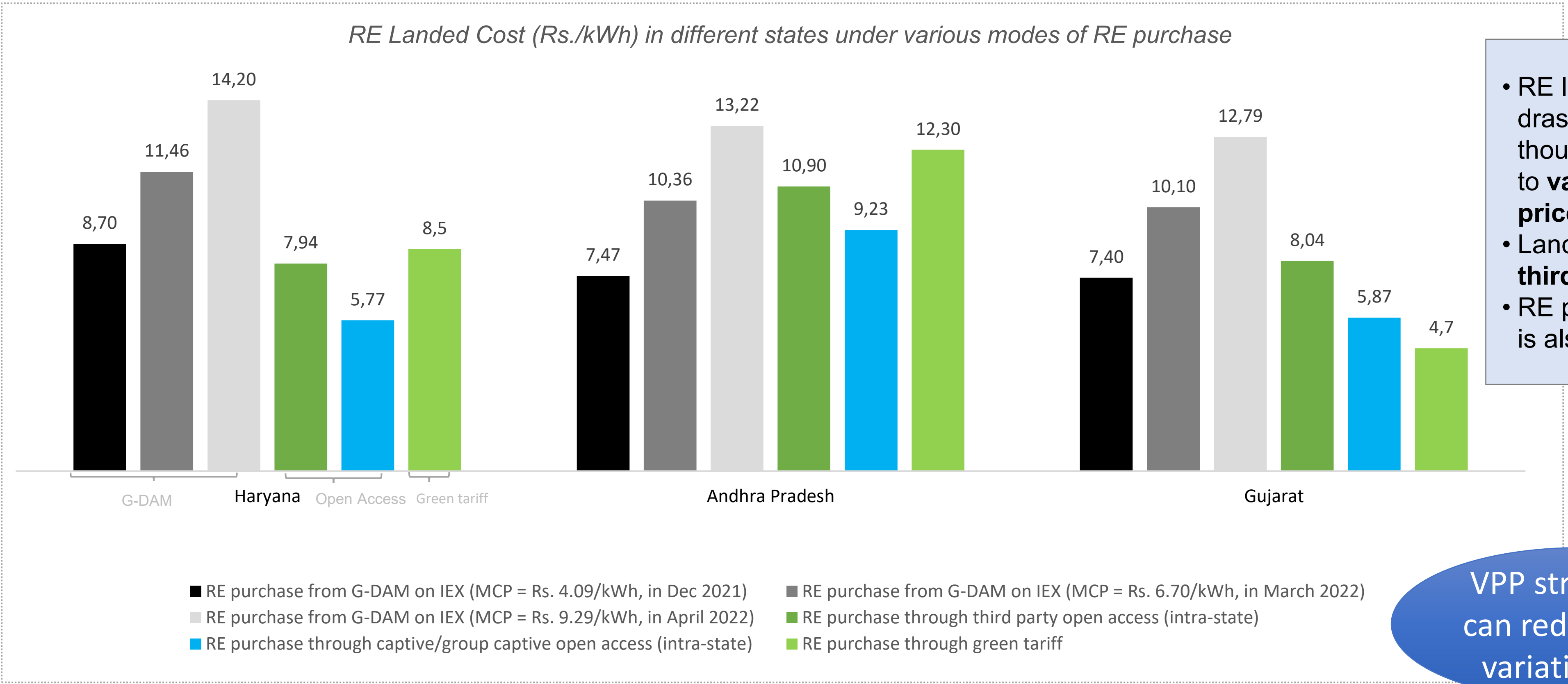
VPPA will help the C&I consumer to meet its RE 100 sustainability targets

VPPA will help the state governments in meeting RE targets through increased deployment of RE in the state

C&I renewable capacity by June 2022: 23 GW, which signifies that only 7% of the total C&I demand is being met by RE*

Case Study

- *RE landed cost under various modes of RE purchase varies considerably*



- RE landed cost varies drastically for procurement though power exchanges due to **varying market clearing price**
- Landed cost for RE is high for **third party open access.**
- RE purchase through Discoms is also costly

VPP strike price can reduce price variation risks

Source: IEX, CEEW, SAREP Research

Risks and Mitigation Plan

Risk associated with VPPA	Mitigation Strategy
Financial Risk: Estimating the 'strike price' for the future 25 years	• Tenure of a VPPA can initially be kept for 3-5 years to reduce apprehensions around long term VPPAs • Utilizing best in class energy price forecasting models and doing a comprehensive financial analysis
Contractual, Execution and Operation Risk: Dispute between the buyer and seller during VPPA tenure	• All probabilities and scenarios (detailed contours) related to supply and purchase of power under VPPA should be thought of and included in the agreement while signing a VPPA, such as what if green attributes are not delivered by the developer, what if any one of the entity wishes to come out of the agreement, etc. • Provisions for efficient accounting and legal performance may be mentioned in the agreement • Provisions regarding market risk sharing (between C&I consumers and RE developer) may be mentioned in the agreement as per mutual consent • Agreement can be secured with suitable dispute resolution mechanism/exit clauses for both buyer and the seller
Liquidity risk: No offtake of power generated on the power exchange –	Pricing power at a reasonable rate which is competitive to the market

Key Takeaways/ Recommendations

- Establishing operating framework and regulations (including regulatory compliances, jurisdictional responsibility matrix, etc.) around VPPA
- Preparing a standard PPA document – guiding document for entities entering in to a VPPA

Thank You

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