

# *National Workshop on* **Exploring Virtual Power Purchase Agreements for India**

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***Virtual Power Purchase Agreements - Concept***  
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*Disclaimer: This document was produced for review by the United States Agency for International Development. It was prepared by RTI International for the South Asia Regional Energy Partnership (SAREP) activity, task order number 72038621F00002.*

# Presentation Outline

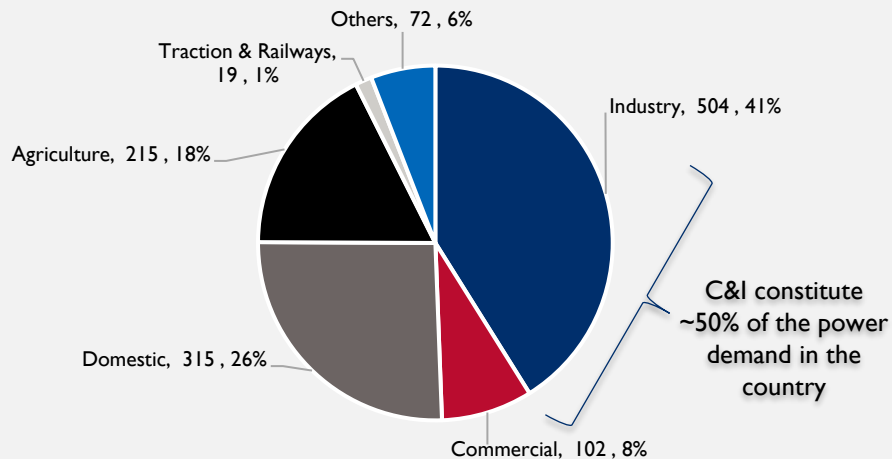
1. Context – Why VPPA is Needed?
2. What is a VPPA?
3. Potential and Benefits of VPPA for India
4. VPPA adoption in the US and Europe
5. Way Forward



# Context

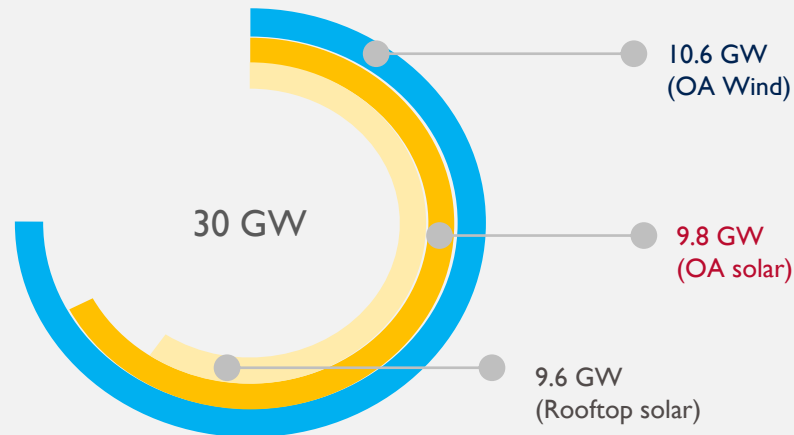
# To Achieve India's 2030 RE target, C&I Customers Need to Increase RE Consumption

Consumption of Electricity (BU) by different sectors in India (2020-21)



Source: Ministry of Statistics & Programme Implementation

RE procurement by C&I segment (until March 2023)



Source: Bridge to India

C&I customers consume 50% of the total electricity consumption in the country but the share of RE in their consumption is only 9% \*

OA = Open Access

\*PPA signed/Total C&I demand = (30 GW\*8.76\*20%)/(606 TWh) where 20% is the average CUF of RE plant

# Existing RE procurement mechanisms for C&I customers have challenges

## Open Access

1

- Multiple PPA required across states and compliance to state regulations
- Uncertainty in OA charges
- Resistance from DISCOMs in getting OA approvals

## Green Tariff

2

- Charged at a premium
- Subject to the availability of surplus renewable power with the DISCOMs

## Renewable Energy Certificates (REC)

3

- Prone to market fluctuation and volatility – quantum and price
- Do not assign back to any project making it difficult for consumers to prove additionality

## Green Power on Power Exchange

4

- Prone to market fluctuation and volatility – quantum and price
- Merchant RE plants face difficulty in getting the funding due to uncertainty in revenue stream

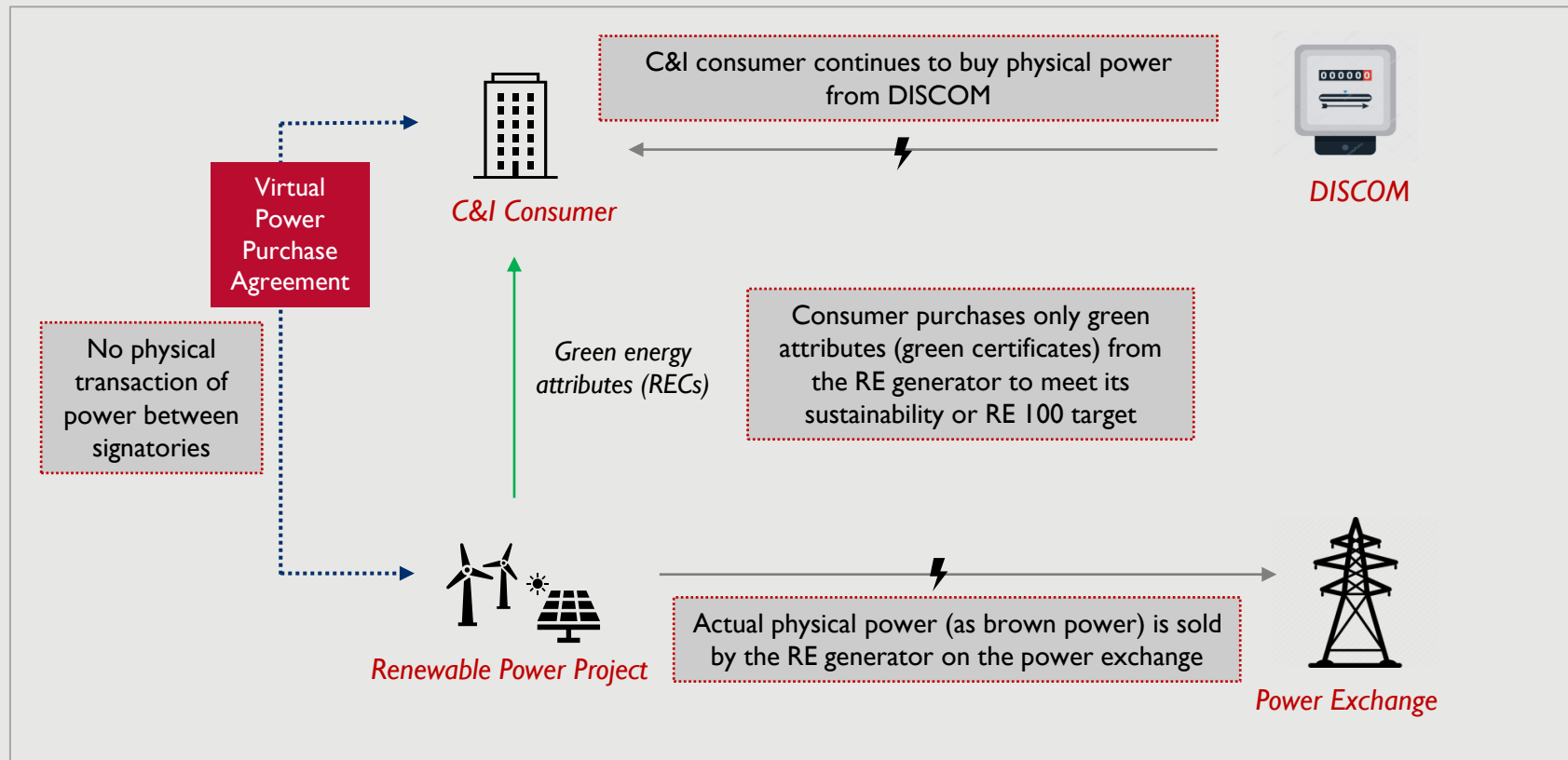
VPPA can be introduced as an additional RE procurement mechanism for C&I customers in India

# WHAT IS A VPPA?

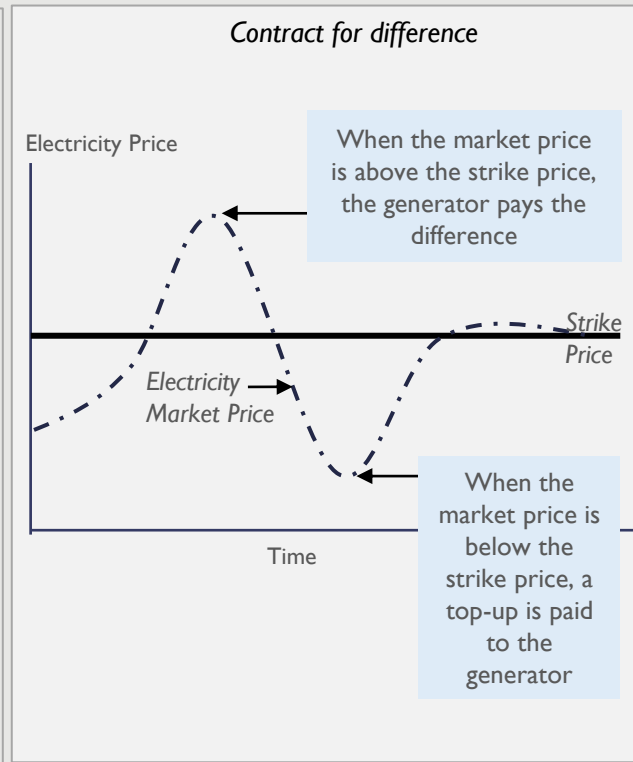
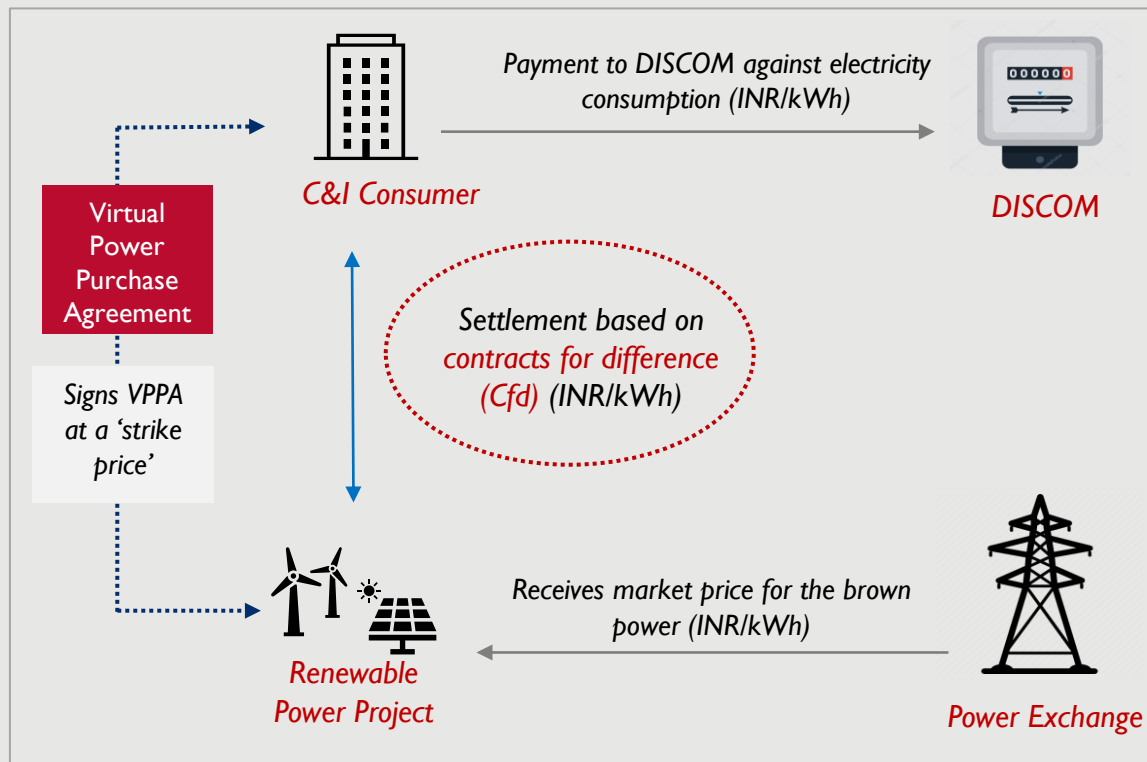
Virtual PPA is a bilateral, renewable energy, financial contract between renewable energy developer and the consumer (buyer), that does not involve the physical delivery of energy between the two entities



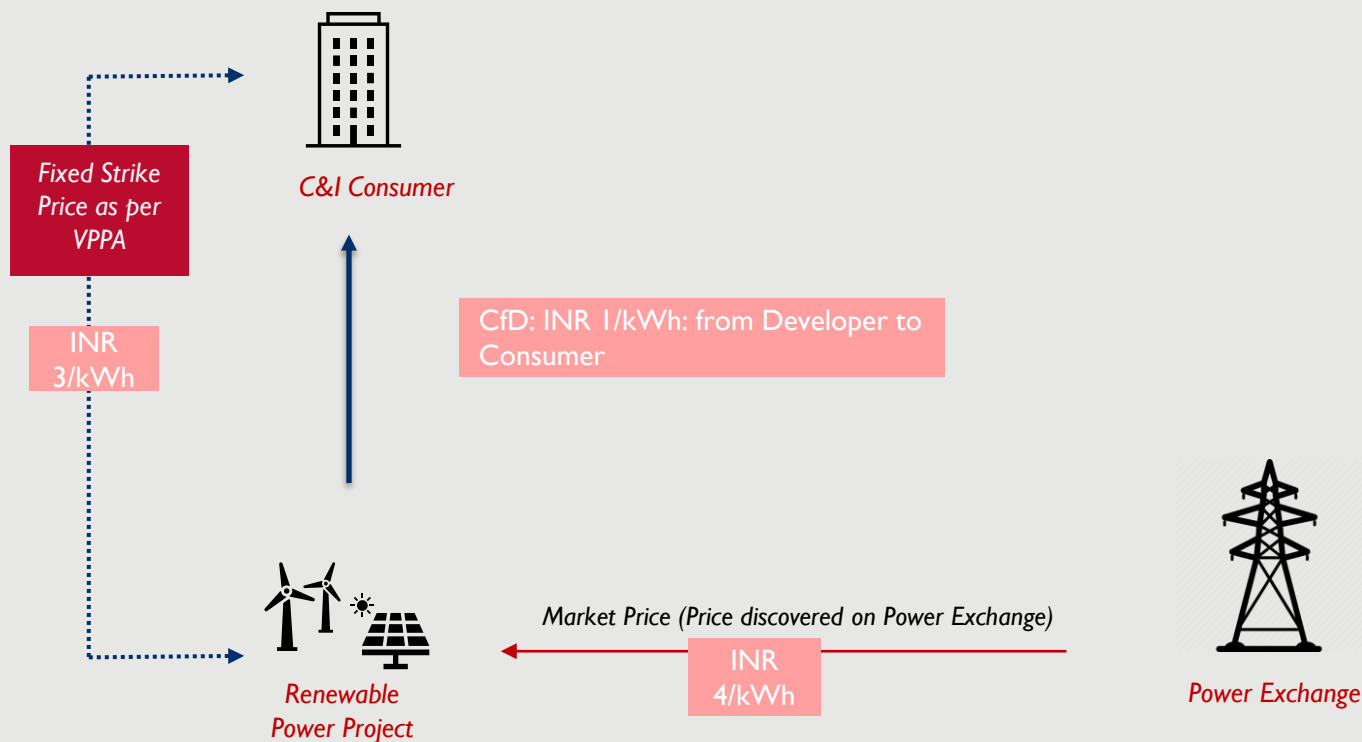
# VPPA Operating Mechanism



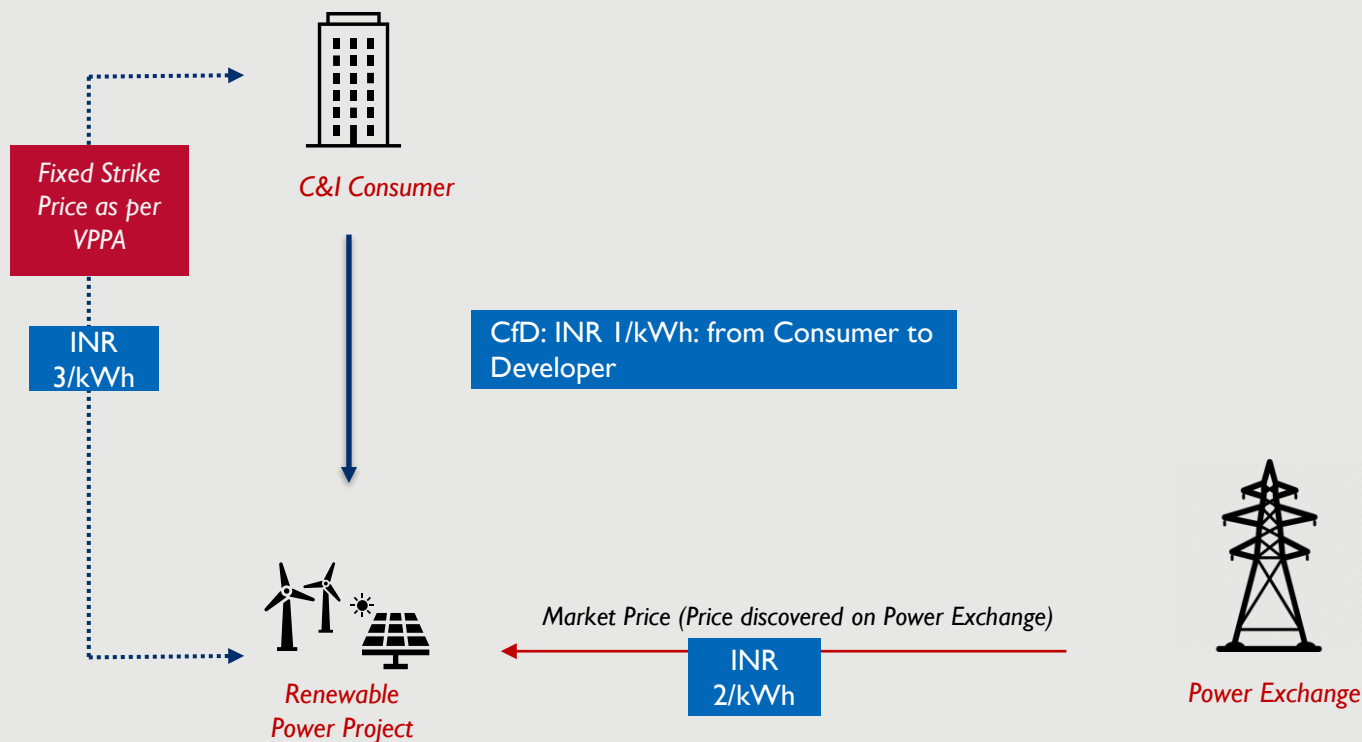
# VPPA Commercial Mechanism (1/3)



# Case I: when Strike Price < Market Clearing Price (2/3)



## Case II: when Strike Price > Market Clearing Price (3/3)



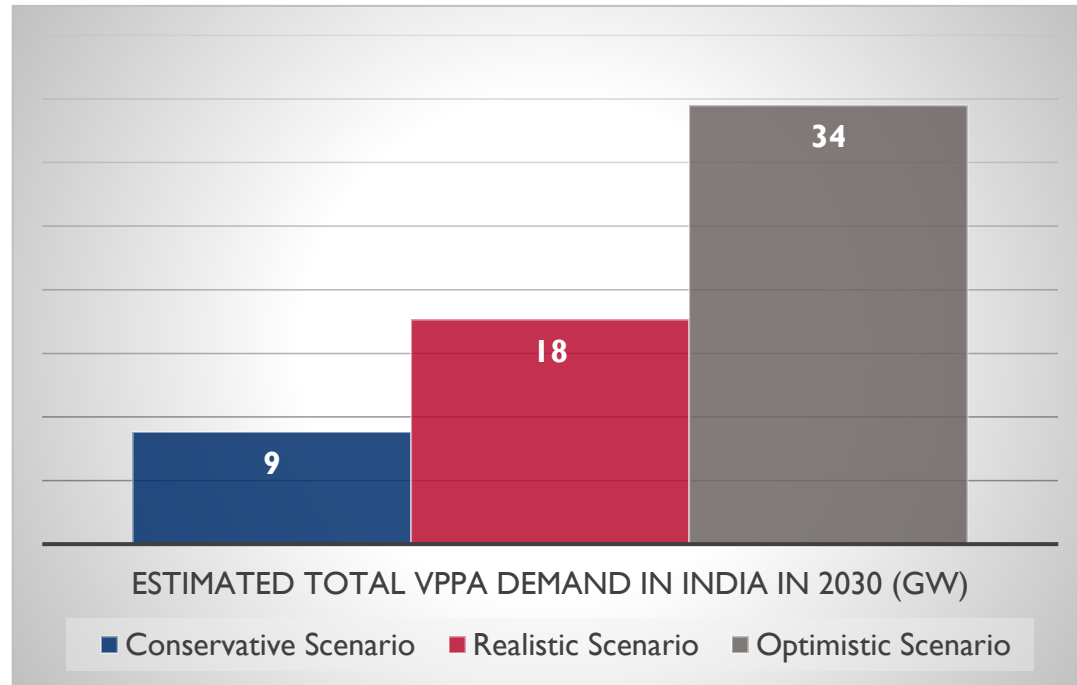
# BENEFITS OF VPPA FOR INDIA



## ***VPPA likely to support in meeting India's 2030 RE target***

**VPPA holds a potential  
of >20GW of RE by  
2030.**

**It will increase RE  
contribution for C&I  
customers from 9% to  
15%**



# VPPA can address the challenges in the existing RE procurement mechanisms in India

	1	2	3	4
	Open Access	Green Tariff	Renewable Energy Certificates (REC)	Green Power on Power Exchange
Challenges of existing RE procurement mechanisms	<ul style="list-style-type: none"> <li>Multiple PPA required across states and compliance to state regulations</li> <li>Uncertainty in OA charges</li> <li>Resistance from DISCOMs in getting OA approvals</li> </ul>	<ul style="list-style-type: none"> <li>Charged at a premium</li> <li>Subject to the availability of surplus renewable power with the DISCOMs</li> </ul>	<ul style="list-style-type: none"> <li>Prone to market fluctuation and volatility – quantum and price</li> <li>Do not assign back to any project making it difficult for consumers to prove additionality</li> </ul>	<ul style="list-style-type: none"> <li>Prone to market fluctuation and volatility – quantum and price</li> <li>Merchant RE plants face difficulty in getting the funding due to uncertainty in revenue stream</li> </ul>
How VPPA overcomes these challenges	<ul style="list-style-type: none"> <li>Aggregation of contracts for different states</li> <li>VPPAs not seen as a threat to utility</li> </ul>	<ul style="list-style-type: none"> <li>VPPA signed on a firm contract basis</li> <li>Will help in meeting sustainability targets/ RPO target of consumers</li> </ul>	<ul style="list-style-type: none"> <li>Firm revenue to the RE developer – strike price</li> <li>New built project for the consumer – offers clarity on additionality clause for reporting</li> </ul>	<ul style="list-style-type: none"> <li>Firm revenue and firm strike price, will encourage merchant RE</li> <li>Quantum to be supplied is known to the RE developer</li> </ul>

3

## *VPPA is a win-win for all Stakeholders across the value chain*



RE developer

- Firm source of revenue for contract duration
- Encourage Merchant RE plants



C&L consumers

- Help meet sustainability targets/ RE 100 targets
- VPPA offered from new projects are dedicated to consumers, help meets additionality criteria for reporting



State government

- Help meet the RE targets through increased deployment of RE in the state.



Discoms

- Likely to help maintain DISCOM revenues intact as consumer likely to procure electricity from DISCOMs to meet their electricity demand



# VPPA ADOPTION IN THE UNITED STATES AND EUROPE

# Many C&I consumers in the U.S. and Europe have signed VPPAs to meet their RE targets and sustainability goals

Few Key VPPAs signed by C&I consumers						
Country	Consumer Name	Industry type	Contracted capacity	Resource Mix	Duration (Years)	Provider
U.S.	Huhtamaki	Food Packaging	42 MW	Wind	12	NextEra Energy Resources
U.S.	AT&T	Technology & Telecom	1,150,023,740 kWh/year	Wind	5	NextEra Energy Resources
U.S.	AT&T	Technology & Telecom	816,801,570 kWh/year	Wind	15	NextEra Energy Resources
U.S.	Mars, Incorporated	Food & Beverage	726,633,050 kWh/year	Wind	20	Mesquite Creek Wind, LLC
U.S.	Apple	Electronics	111 MW	Wind	12	Geronimo IL Wind Project
U.S.	Microsoft Corporation	Technology & Telecom	222,812,000 kWh/year	Solar	15	Pleinmont Solar 2 LLC
U.K.	DLA Piper	Legal	13 MW	Solar		NextEnergy Capital
U.K.	British Telecom Group	Telecom	42 MW	Wind	10	BayWa r.e.
Pan-Europe	Philips and consortium	Technology	-	Wind	10	Neoen
Pan-Europe	AB InBev Beers	Beverage	130 MW	Solar	10	BayWa r.e.

In the **United States**, VPPAs account for 43% of total C&I offsite solar power procurement

# WAY FORWARD

## Way forward

- **Market sensitization** required to build capacity and identify challenges, risks, etc.
- **Modus Operandi** needed for Indian market
- **Regulations or guidelines** needed identifying scope of each stakeholder, accounting, settlement etc.
- **Standard PPA** for RE developer and C&I consumers

# Thank you

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