

BRPL' Standpoint on DERs

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BSES Rajdhani Power Ltd.

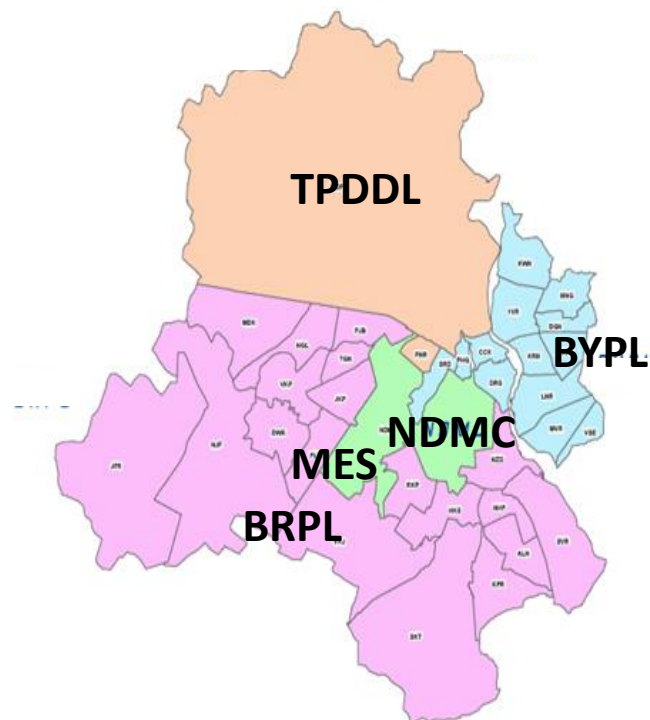
BSES is a JV of Reliance Infrastructure (51%) and Govt. of Delhi (49%)

Agenda

- Overview of BRPL
- Key Challenges
- Focus Areas
- Conclusion

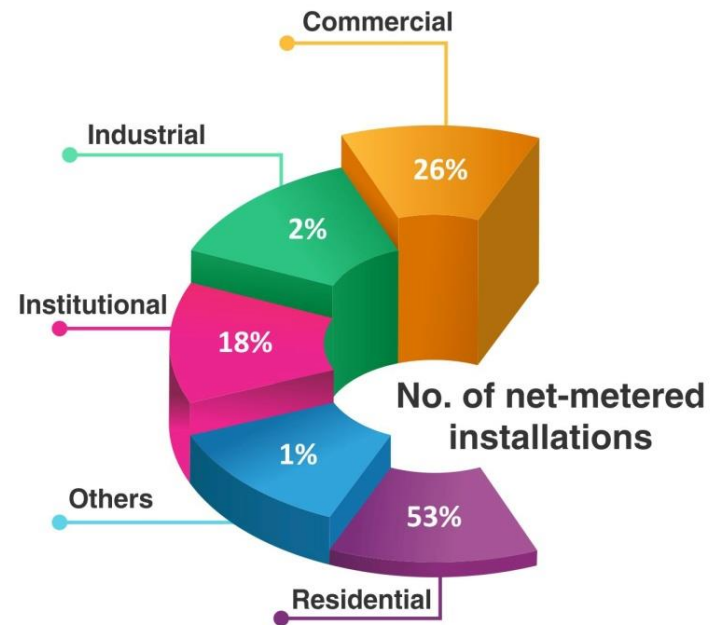
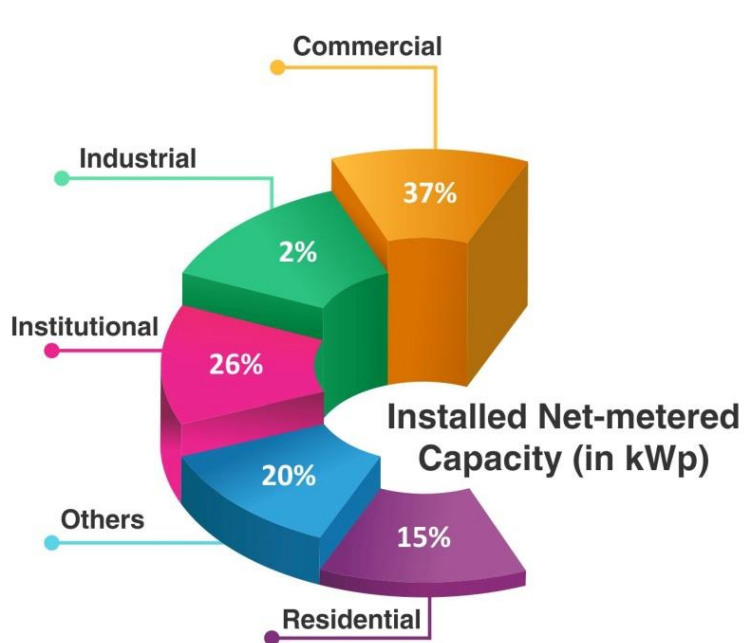
BRPL Profile

- BRPL is the largest Discom in Delhi, covering 750 sq. km of area (West and South) with a population density of 2665 per sq km.
- More than 2.4 Million customers
- JV between Govt. of Delhi (49%) and Reliance Infrastructure Ltd (51%).
- Met peak demand of over 3000 MW in summer 2018



- BSES caters to 2/3rd of Delhi
- South & West Delhi by BRPL

BRPL' Rooftop Solar Journey till Oct 2018



- 1054 Installations completed, 34.5 MWp ; Another 16 MWp in Progress
 - Y1: 90 Nos, 3.2 MWp, Y2: 155 Nos., 3.8 MWp , Y3: 351 Nos., 14.4 MWp
- Capacity of Solar 34.5 MWp against sanctioned load of 135 MW (~25%)

FY 2021-22 : RE portfolio

S#	Description	Capacity (MW)	Energy (MUs)
1	SOLAR		
1.1	Roof top solar - Net metering	120.0	147.17
1.2	SECI Solar Rajasthan	20	42.75
1.3	Thyagraj	1	0.96
1.4	SECI bid for Solar	400	665.76
	Sub-total	541.0	856.64
2	NON-SOLAR		
2.1	TOWMCL	8	60
2.2	MSW Bawana	10	52
2.3	100 MW – PTC wind	100	291.71
2.4	SECI- 150 MW Wind	150	593.93
2.5	Short term tie up	-	-
2.6	SDMC – 25MW	8.67	41.96
2.7	EDWPCL	3.1	14.89
	Sub-total	279.75	1054.22
	Gross Total	820.75	1910.86

Renewables in Power Portfolio ~ 20-25% by Capacity

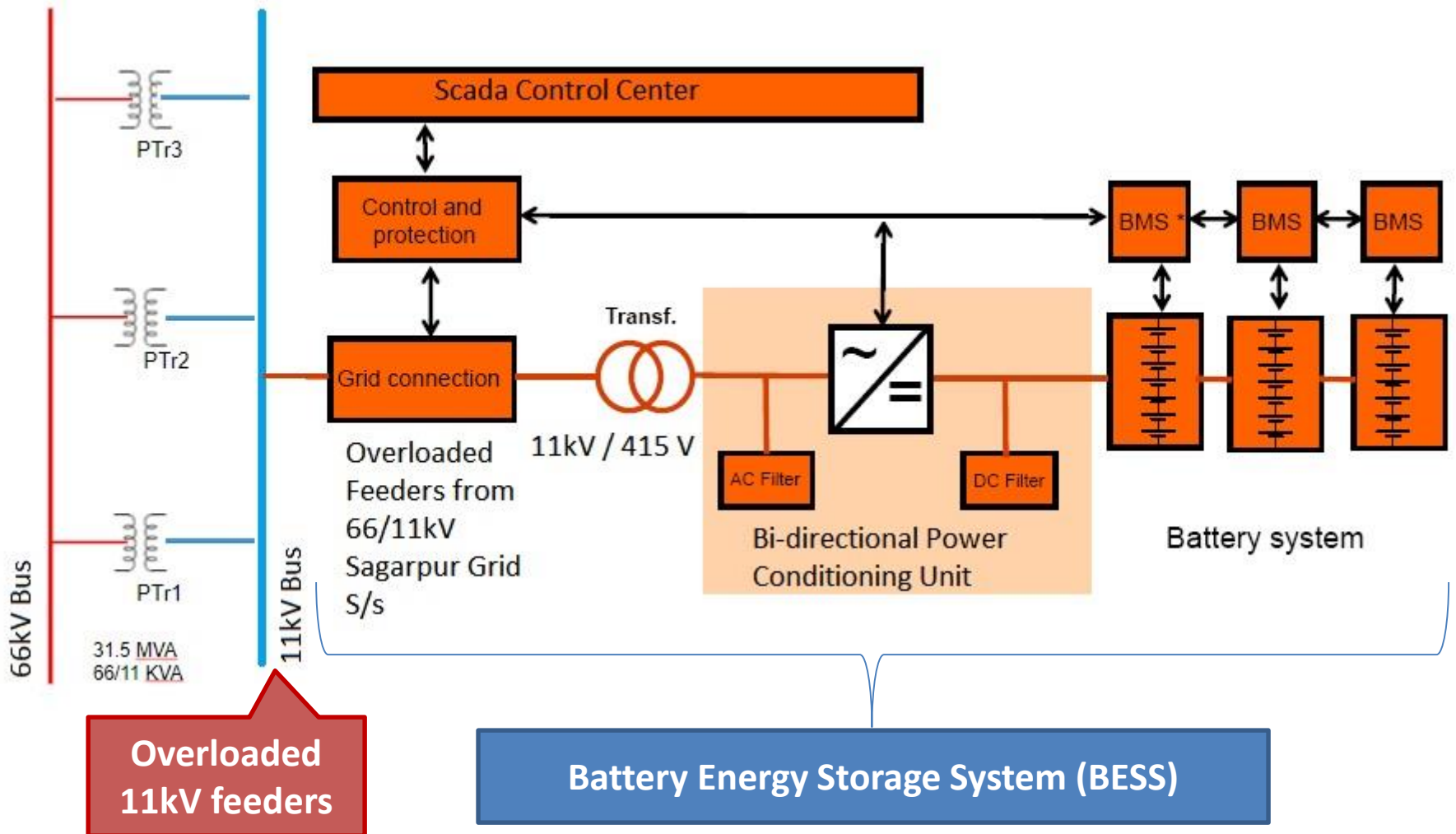
against the current levels of 2%

EV Infrastructure and EV Adoption

- Committed to transitioning the entire fleet by electric vehicles (EVs).
- BRPL plans to encourage uptake among its business associates and employees, and deliver awareness programs for its 2.5 million customers in New Delhi on the benefits of EVs.
- To support wider adoption of EVs, BRPL has volunteered its power distribution networks for research on the impact of renewable power sources and EV charging on the electric network.
- Committed to green and sustainable initiatives that benefit our customers and the larger population. Building on early steps of EV adoption, we hope to accelerate reliable and affordable EV infrastructure.



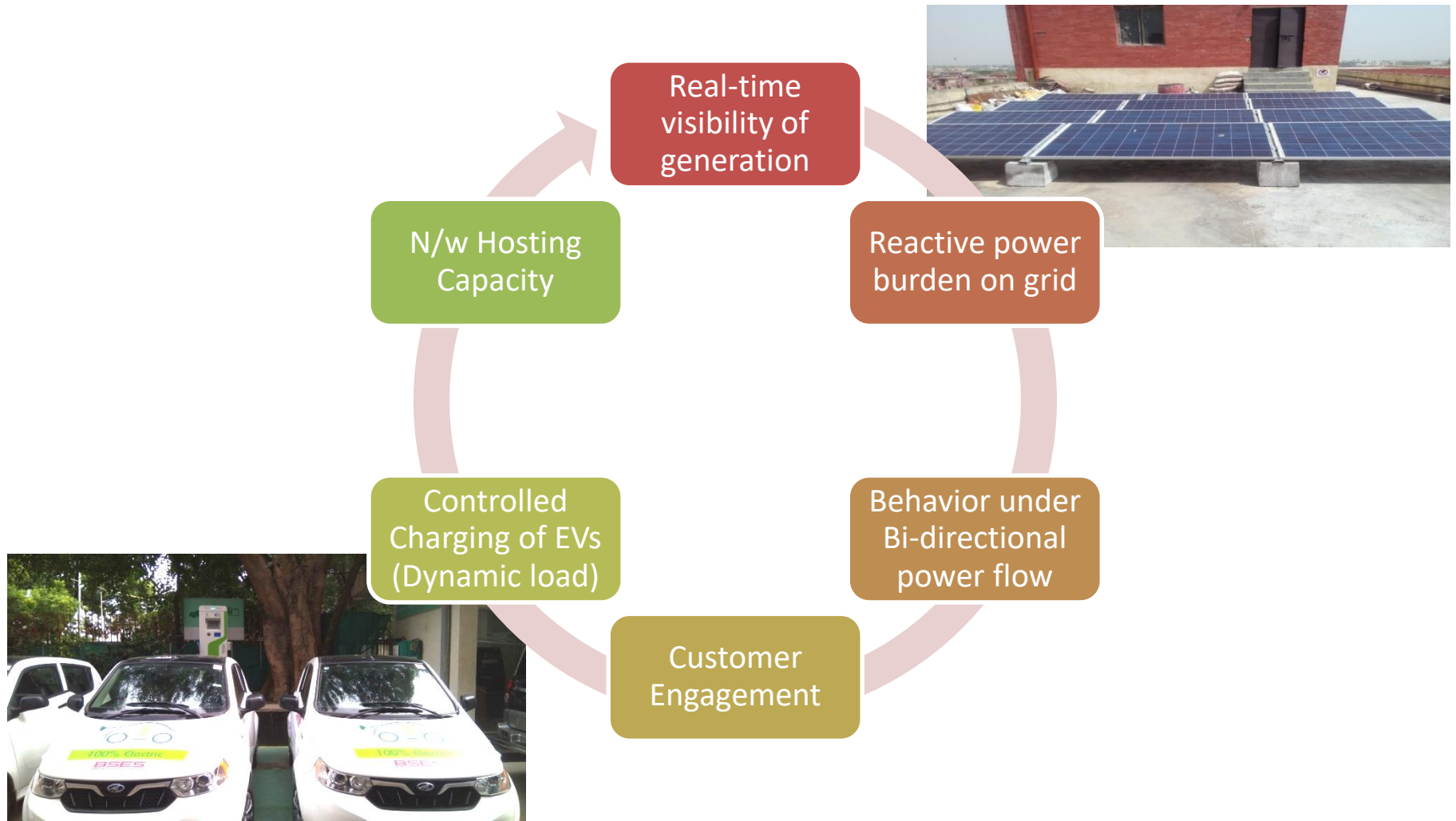
Grid / Distributed Scale BESS



1. BESS discharges at 11 kV level and relieves the 11kV feeders as well as PTRs
2. The charging of BESS is also achieved from 11 kV feeder

Present Challenges with DERs

Present Challenges with DERs



Focus Areas

Smart Meter / Grid : What is the purpose?

- **More efficient operations**, .e.g. eliminate meter reading and field visit jobs
- **Enable Demand Response programs**: direct load control, dynamic pricing
- **Enable distributed resources to be integrated into grid operations**
- **Improve reliability of service**: outage detection and management
- **Improve grid operations and efficiency**; integrate renewables
- **Link customer's side of the meter to utility operations**: in-home devices, appliances

BESS – Grid Scale / Distributed Scale

Renewable Integration

- Improves the integration of renewable energy resources
- Reduces greenhouse gas emissions

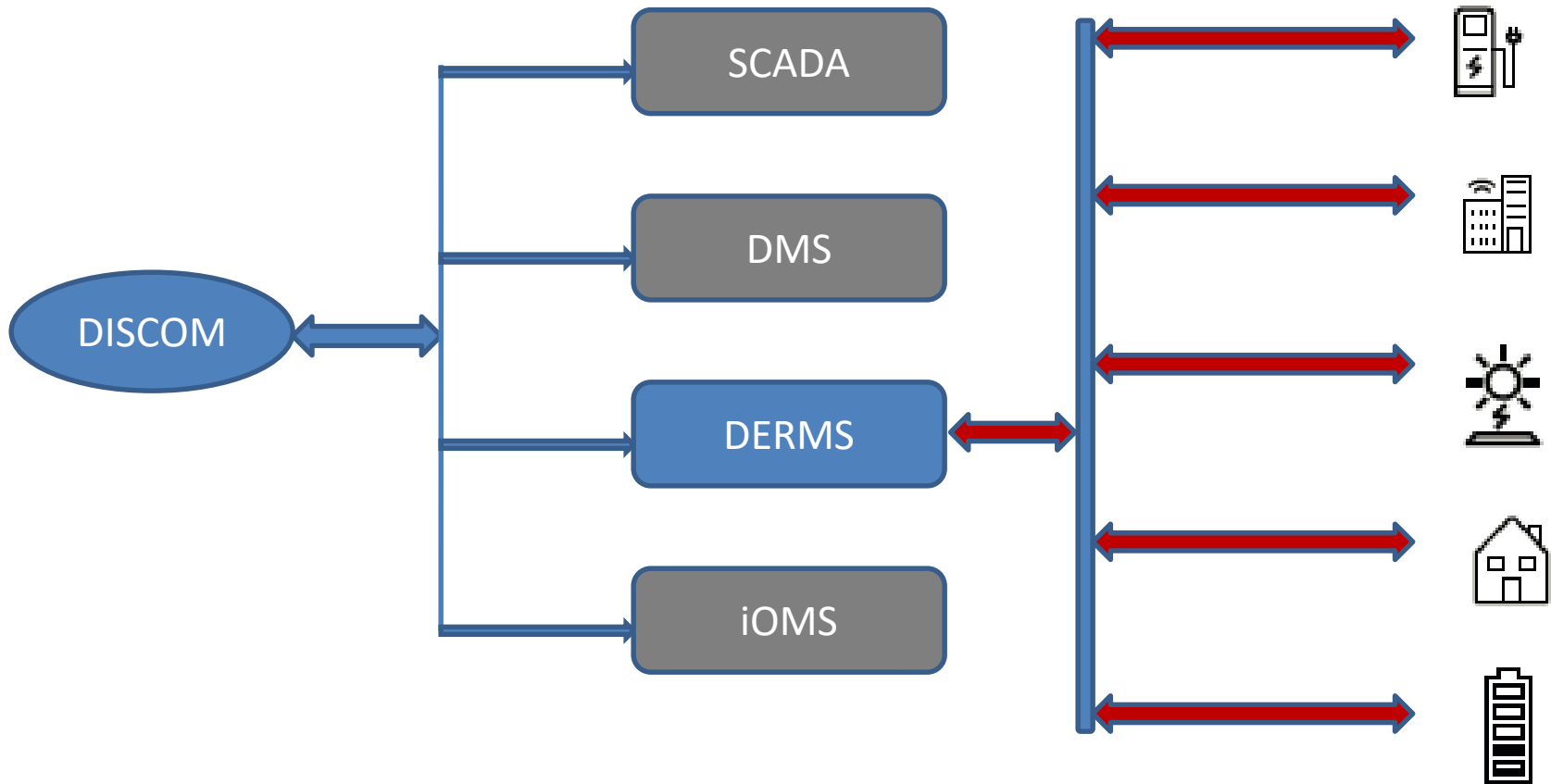
Grid Benefits

- Supports overall grid operations
- Can be placed strategically in locations on the circuit where they are needed most, with modular designs that address space and other constraints.
- Provides additional capacity to the grid in times of need
- Potentially defers capital upgrades
- Can be charged during off-peak times, such as mornings, and then discharged during peak times, such as hot afternoons, to reduce peak energy needs

DERMS / CMS for RTSPV / EVs / BESS

- Integration of all RTS PV plants at a single dashboard
- Forecasting of generation – Day-ahead & Intraday
- Analytical Cloud Based Platform for Electric Vehicle (EV) Charging Station Asset Management/ Operation
- Modelling energy requirement and demand forecasting for energy requirement of EV's
- Realtime Utilization of electric vehicle charging infrastructure
- Billing Platform based on the services provided

Schematic



Thinking Ahead

- Significant burden on utility transformers and distribution system
- What if off-peak usage gets more expensive due to demand?
- Questions:
 - Who pays: all customers or cost causers?
Ratepayers or taxpayers?
 - Should this potential development be used to demand TOU rates for all?
 - Can plug in devices control time of energy flow?
 - In home or neighborhood plug in options?

Thank You

BRPL Initiatives with GIZ

- **Large scale Grid Integration study for RTS - completed**
 - Objective was to know the impact on Distribution Network by large scale integration of distributed PV plants in the electricity distribution system
 - Recommendations being used in Technical feasibility assessment of RTS
 - Techno-commercial impacts of single phase connected PV Port + Store system on distribution network installed at individual premises having sanction load >5 kW
 - In progress
- **Consumer Outreach and Utility anchored demand aggregation program launched in Dwarka (Focused on residential segment) - Ongoing**
 - Solarization of roofs aggregating to ~1000 kW achieved.
 - Considerable Interest, especially in RESCO mode (No upfront payment)
 - More active role of Discom to further boost the solarization – planned in other areas now, with support and coordination with GIZ.

BRPL Initiatives with GIZ (continued)

- **Large scale RE Integration and EV penetration – BRPL’s portfolio expected to have >20% RE by capacity in next 2 years (compared to <1% now)**
 - Role of Distribution level energy storage in improving stability and helping RE integration to be investigated
 - Increased Electromobility and RE penetration present unique opportunity to study its impact on Discom operations

FY 2021-22 : RE portfolio

S#	Description	Capacity (MW)	Energy (MUs)	Remarks
1	SOLAR			
1.1	Roof top solar - Net metering	120.0	147.17	Cumulative capacity
1.2	SECI Solar Rajasthan	20	42.75	Plant in operation. Quantum as per PSA
1.3	Thyagraj	1	0.96	PSA signed, plant in operation
1.4	SECI bid for Solar	400	665.76	EoI submitted and SECI initiated bidding process and expected to be finalized by Jul'18
	Sub-total	541.0	856.64	
2	NON-SOLAR			
2.1	TOWMCL	8	60	Installed capacity 16 MW out of which BRPL share is 50%. Plant in operation. (Source: ARR)
2.2	MSW Bawana	10	52	Installed capacity 24 MW out of which BRPL share is 41.7%. Plant in operation (Source: ARR)
2.3	100 MW – PTC wind	100	291.71	PSA signed, likely to be commissioned by Oct'18
2.4	SECI- 150 MW Wind	150	593.93	Project expected to be commissioned by Oct'19. Supply from Nov'19.
2.5	Short term tie up	-	-	RE non solar HPSEB tied up for May'18 to Oct'18
2.6	SDMC – 25MW	8.67	41.96	Recently SDMC issued LOI and likely to be commissioned in 27 months from LOI date. Gross capacity 25MW, Net capacity is 85%
2.7	EDWPCL	3.1	14.89	Gross capacity 12 MW, allocation considered as per current SLDC allocation; DERC order on allocation awaited
	Sub-total	279.75	1054.22	
	Gross Total	820.75	1910.86	

FY 2017-18 : RE portfolio

S#	Description	Capacity (MW)	Energy (MUs)	Remarks
1	SOLAR			
1.1	Roof top solar - Net metering	21.4	13.60	Cumulative capacity
1.2	SECI Solar Rajasthan	20	43.60	Plant in operation. Quantum as per PSA
1.3	Thyagraj	1	0.98	PSA signed, plant in operation
1.4	SECI bid for Solar	-	-	EoI submitted and SECI initiated bidding process and expected to be finalized by Jul'18
	Sub-total	42.4	58.18	
2	NON-SOLAR			
2.1	TOWMCL	8	85.70	Installed capacity 16 MW out of which BRPL share is 50%. Plant in operation. (Source: ARR)
2.2	MSW Bawana	10	40.49	Installed capacity 24 MW out of which BRPL share is 41.7%. Plant in operation (Source: ARR)
2.3	100 MW – PTC wind			PSA signed, likely to be commissioned by Oct'18
2.4	SECI- 150 MW Wind			Project expected to be commissioned by Oct'19. Supply from Nov'19.
2.5	Short term tie up			RE non solar HPSEB tied up for May'18 to Oct'18
2.6	SDMC – 25MW			Recently SDMC issued LOI and likely to be commissioned in 27 months from LOI date. Gross capacity 25MW, Net capacity is 85%
2.7	EDWPCL			Gross capacity 12 MW, allocation considered as per current SLDC allocation; DERC order on allocation awaited
	Sub-total	18	126.19	
	Gross Total	60.4	184.37	