Promotion of Net-Metering in SAARC Member States

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BSES Rajdhani Power Ltd, New Delhi, India

08th Sep 2020
Agenda

• BRPL – Brief Profile
• Solar Rooftop Initiatives at BRPL
• Net Metering in Solar Rooftop PV
• Perspective with respect to Solar rooftop
• Group Net Metering & Virtual Net metering
• Utility facilitated RTS model for Residential
• Summary
<table>
<thead>
<tr>
<th>Distribution Area</th>
<th>750 sq. Km</th>
</tr>
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<tbody>
<tr>
<td>No. of customers</td>
<td>2.55 Mln.</td>
</tr>
<tr>
<td>Customer Density</td>
<td>3400 /sq Km</td>
</tr>
<tr>
<td>Max Demand met (Till Date)</td>
<td>3211 MW</td>
</tr>
<tr>
<td>Annual Billed energy FY19</td>
<td>12,194 MU</td>
</tr>
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<td>AT&amp;C Loss FY19</td>
<td>8.06 %</td>
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- **Consumer Mix**
  - About 86% residential contributing to ~70% consumption
  - RE ~ 29% of portfolio (1300MW+) by ‘21-22

- **Peak Demand Met**
  - BRPL Peak demand growth ~ 6% CAGR; BRPL’s share is ~43% in energy terms
  - > 43% reduction since Year ‘02

- **TPDDL**
  - TPDDL

- **BRPL**
  - BRPL

- **BYPL**
  - BYPL

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Steep Loss reduction post- privatization

BRPL Loss Trajectory

<table>
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<th>FY02</th>
<th>FY19*</th>
<th>Reduction</th>
</tr>
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<td>51.5%</td>
<td>8.06%</td>
<td>~44%</td>
</tr>
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~44% reduction in losses post takeover against 20% rise in a decade up-to privatization
• General Overview:
  • Supply Mix
    • Coal – 68%; Gas – 14%; Hydro – 13%; RE – 3%; Nuclear – 2%
  • Consumer mix – Next slide

• Solar rooftop:
  • Potential in BRPL area – About 500 MWp
  • Installed net-metered capacity – ~52 MWp as on 31\textsuperscript{st} Oct ‘19
  • Plans/trajectory for future – Expect to Add ~27 MWp more till Mar’19.
% of No. of consumer

- Domestic: 85.6%
- Commercial: 13.5%
- Industrial: 0.2%
- Others: 0.4%

% by Connected load

- Domestic: 65%
- Commercial: 29%
- Others: 3%
- Agriculture: 0%
- Industrial: 3%

Domestic load contributes 65% of consumption
BRPL’s Rooftop Journey till YTM Aug 20

RTS installations capacity crossed 69 MWp in Aug ‘20

No. of net-meter installations in FY18-19 is higher than cumulative no. of installations in last 3 FYs

Solar tenders supported by WB Suprabha Program
BRPL’s Rooftop Journey till YTM Aug 20

No. of net-metered installations

- Residential: 51%
- Institutional: 26%
- Commercial: 18%
- Others: 1%

Installed solar capacity

- Residential: 17%
- Institutional: 39%
- Commercial: 39%
- Others: 4%

- Others: 4%
Renewable Energy in Delhi

- **Power Demand**: Touched 7400 MW in July ‘19
  - 65% more than Mumbai, 3 x of Kolkata, 4 x of Chennai
  - Doubled in past decade; Increasing by over 6% each year

- **Limited Generation** in Delhi Grid dependent for over 80% of requirement

- **Solar and Waste to Energy** are the two RE sources in Delhi

- **Estimated Solar rooftop potential**: ~2000 MW *

- **Day time peak in Summer** that can be complemented by Generation from Rooftop Solar PV

- **Net Metering Regulations** notified by DERC in Dec 2014

- **Delhi Solar Policy** notified in Aug 2016, target of 1503MW by 2022 & 1995MW by 2025, Generation Based Incentive for Residential/Domestic Consumers @ Rs. 2/- per unit

**Delhi, with high per capita consumption & income along with horizontal growth offers a unique opportunity to be the Rooftop Solar Capital**

*Source: Rooftop Revolution: Unleashing Delhi’s Solar Potential, Bridge to India, Greenpeace Report, 2013*
Net Metering and its Benefit for Grid-connected Rooftop Solar for Domestic Consumers in Delhi
Energy Flow Diagram under Net-Metering

Source: http://solarbses.com/
Project Economics for a rooftop solar plant at Independent House / Kothi

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<th>Description</th>
<th>Value</th>
<th>Unit(s)</th>
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<tr>
<td>No. of units saved for Billing due to Solar installation and GNCTD subsidy</td>
<td>140</td>
<td>unit (kWh)</td>
</tr>
<tr>
<td>Weighted Avg. Electricity Tariff incl. Surcharges, Taxes &amp; Duties*</td>
<td>₹6.19</td>
<td>per unit (kWh)</td>
</tr>
<tr>
<td>Savings in Fixed Charges due to GNCTD subsidy**</td>
<td>₹168</td>
<td></td>
</tr>
<tr>
<td>Average monthly savings in Electricity Bill</td>
<td>₹1,034</td>
<td></td>
</tr>
<tr>
<td>Payback period</td>
<td>2.03</td>
<td>year</td>
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**Assumptions:**
- Solar plant capacity: 5 kWp
- Average monthly solar generation, kWh: 109.5 units per kWp of Solar plant capacity
- Self-funded with zero loan

**Calculation:**
- Weighted Avg Tariff = ₹4.93/ - per unit excl. Surcharges, Taxes & Duties with monthly consumption of 700 units
- As per GNCTD subsidy order, entire bill amount waived off for consumers utilizing up to 200 units per month and subsidy of ₹800/- up to consumption of 400 units per month
Over 22 solar PV integrators empanelled by Discosms under the scheme
Subsidy Disbursement Process

<table>
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<th>Solar Capacity (kWp)</th>
<th>Subsidy (%)</th>
</tr>
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<td>1 – 3</td>
<td>40%</td>
</tr>
<tr>
<td>&gt; 3 – 10</td>
<td>20%</td>
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Source: E&Y, WB
Key Initiatives/Recommendation

- **BRPL Solar City Initiative**
- **Solar Central Monitoring system (pilot)**
- **One stop portal for all FAQs about solar**
- **Demand Aggregation through consumer outreach**
- **Online submission of NM applications**
- **Dedicated solar help line +91-11-39999707 Option 9**

**Solar Mobile App developed under EU-India collaboration**

**Recommendation:**
- Utility facilitated Hybrid Model to tap smaller size rooftop installations in residential sector
Solar Rooftop Portal - BRPL

BRPL SOLAR CITY INITIATIVE
PROMOTING INSTALLATION OF GRID-CONNECTED ROOFTOP SOLAR PV UNDER ITS LICENSEE AREA IN DELHI

Avail Central Financial Assistance of 30%* from Ministry of New and Renewable Energy, Govt. of India
Consumer Outreach Activities

Webinars with Resident Welfare Associations on weekly basis
### Perspective with respect to Solar rooftop

#### Benefits of Solar Rooftop
- Peak Shaving and Power Purchase cost optimization
- Network congestion relief
- Network upgrade capex deferral
- Reactive Power and Voltage control opportunities
- Avoidance of POC and STU losses in serving load
- RPO benefits

#### Challenges
- Integration with Grid (DT penetration)
- Lack of viable funding options (CAPEX mode)
- Lack of payment security mechanism, lack of trust, performance (OPEX)

#### Opportunities perceived
- Solarize roofs in congested network areas
- Introduce battery storage combined with solar PV
- Synchronize with EV charging
Group Net Metering

- Delhi Electricity Regulatory Commission has recently notified (Group Net Metering and Virtual Net Metering for Renewable Energy) Guidelines, 2019

- **Group Net Metering:**
  - Applicable for all consumers of NCT of Delhi
  - Surplus energy generated from RES or BESS charged thru’ RES is exported to Grid
  - Exported energy is adjusted in more than one service connections of the **same** consumer within same **Discom** area
  - Surplus units injected into the grid shall be adjusted against the energy consumed in the monthly bill of service connection(s) in a **sequence indicated in the priority list provided by the consumer**
  - **Sequence begins with the connection where RES is located**

Under Phase 2 of RTS, CFA shall be available only if the RES is located on Residential metered connection premise
Virtual Net Metering

- **Virtual Net Metering:**
  - Entire energy generated/injected from a RES or BESS charged through RES is exported to the grid from renewable energy meter/ gross meter
  - The energy exported is adjusted in more than one electricity service connection(s) of **participating consumers** located within **the same distribution licensee’s area of supply**
  - The energy generated from RES shall be credited in the monthly electricity bill of each participating consumer(s) **as per the ratio of procurement from RES indicated under the agreement/ MoU** entered by the consumer(s)

**Under Phase 2 of RTS, CFA shall be available only if the RES is located on Residential metered connection premise**
GNM and VNM – Key Points

• Annual Generation of RES (with or without BESS) may be capped at a CUF from time to time (Payment of GBI)

• The Discom shall bear SLD and network augmentation cost for Res registered under Mukhyamantri Kisan Aay Badhotri Yojna and same is pass-through in ARR (COD upto 31-Mar-22)

• RES capacity under GNM and VNM – 5 kWp to 5000 kWp

• The solar generation under Net-metering regulation shall qualify for RPO of Discom, if RES is not an obligated entity
Blockchain in Rooftop Solar

- Wonderful Technology for democratization of electricity
- Technology is mature – Multiple players in the market
- Proven in Financial sector; Multiple applications in energy sector

Key questions to be clarified:
- Legal provisions for such transaction under the EA
- Taxation provisions
- Metering infra and communication backbone
- Retail Energy Market related regulations
- As a tool to further GNM and VNM in Delhi
Go Solar

Contact Information:
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