Towards Ujwal Bharat
UDAY: The Story of Reforms

9th November, 2015
Team India to serve 125 crore people
MINISTRY OF POWER

MINISTRY OF COAL

MINISTRY OF N&RE

INTEGRATED APPROACH
Enhanced Power Production, 100% Rural electrification

Digital India
Smart grid, Smart Metering, IT enablement, National Power Portal Real time tracking (DELP.in)

Skill India
Skilling people for IT enablement, Gram Vidyut Abhiyantas

Smart Cities
IPDS covers 82 out of 98 smart cities

Energy Efficiency
LED lighting, Industrial Efficiency, Agricultural Pumps

Energy Security

Climate change
Renewable Energy, INDC

Make in India
$250 Bn Investment with substantial local manufacturing

Swachh Bharat
1.28 lakh Toilets constructed for Swachh Bharat
Power Sector Reforms

1956–1991 Pre-liberalization Era

- Electricity (Supply) Act 1948
- Industrial Policy Resolution (1956)
- Generation and distribution of power under state ownership
- Legislative and policy initiatives (1991)
- Private sector participation in generation
- Electricity Regulatory Commissions Act (1998) for establishing CERC and SERCs
- Electricity Act (2003)
- APDRP/ RAPDRP/ RGGVY


- Coal Auctions and record coal production
- Highest Increase in Power generation and Transmission capacity addition
- Implementation of Integrated Power Development Scheme (IPDS) and Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY)
- Biggest LED lighting movement in the World
- Launch of UDAY

2014 onwards Accelerated Growth Trajectory

Ujwal Bharat

from Darkness
Guiding Principles - TRANSPARENCY

• Technology Focus
• Root Cause Analysis
• Accountability
• National Effort – Team India
• Speed, Skill and Smart
• Prioritization
• Achievement Oriented
• Rejuvenate Economic Growth
• Efficiency & Economies of Scale
• National Sustainable Development
• Customer Focus
• Yes We Can
24x7 Power For All

Power Value Chain

DISCOMs are the weakest link in providing 24X7 Power for All
Accumulated DISCOM losses & debt have ballooned in the last few years

Accumulated Loss ~ Rs. 3.8 lakh crore (Mar 15) - Total Loss in last 6 years – Rs. 3.66 lakh crore

Source: Audited DISCOM Accounts   * 2014-15 figure is a projection based on provisional reporting by States
UDAY (Ujwal DISCOM Assurance Yojana) aims at permanent resolution of DISCOM issues

**Past**
- State take over of debt

**Present**
- Operational Efficiency
- Enabling Quarterly Tariff Increase
- Lower Cost of Power

**Future**
- Budgetary Discipline
- Future Bank Lending
- Reduction in Interest Cost
## Stage wise Tariff Increase

<table>
<thead>
<tr>
<th>Activity</th>
<th>Benefit</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enabling provision for quarterly revision to mitigate cost increase burden</td>
<td>Such periodic tariff revision will be easier to implement and absorb by consumers</td>
<td>Necessary changes in tariff policy in a month</td>
</tr>
</tbody>
</table>
Tariff increase no substitute for efficiency improvement

• Regulators cannot pass on inefficiency of DISCOMs to consumers
• States with 30-40% losses can’t expect consumers to pay for their inefficiency
• Most States have maintained tariff increase trajectory – Average annual increase in last five years – 8%
Tariff increase not the only solution to DISCOM distress

Higher than National Average Tariff Hikes

| State            | FY2011-12 | FY2012-13 | FY2013-14 | FY2014-15 | FY2015-16 | Average Hike (%)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerala</td>
<td>0%</td>
<td>30%</td>
<td>7.9%</td>
<td>24%</td>
<td>3%</td>
<td>16%</td>
</tr>
<tr>
<td>Delhi</td>
<td>22%</td>
<td>22%</td>
<td>5%</td>
<td>8%</td>
<td>0%</td>
<td>14%</td>
</tr>
<tr>
<td>Nagaland</td>
<td>34%</td>
<td>12%</td>
<td>7%</td>
<td>0%</td>
<td>5%</td>
<td>14%</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>8%</td>
<td>18%</td>
<td>23%</td>
<td>0%</td>
<td>5%</td>
<td>13%</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>0%</td>
<td>37%</td>
<td>0%</td>
<td>15%</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td>Chhattisgarh</td>
<td>0%</td>
<td>18%</td>
<td>0%</td>
<td>15%</td>
<td>14%</td>
<td>11%</td>
</tr>
<tr>
<td>Tripura</td>
<td>0%</td>
<td>17%</td>
<td>31%</td>
<td>0%</td>
<td>0%</td>
<td>11%</td>
</tr>
<tr>
<td>Haryana</td>
<td>4%</td>
<td>19%</td>
<td>13%</td>
<td>0%</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>0%</td>
<td>13%</td>
<td>7%</td>
<td>15%</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>9%</td>
<td>8%</td>
<td>9%</td>
<td>16%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>J&amp;K</td>
<td>15%</td>
<td>19%</td>
<td>8.5%</td>
<td>0%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Bihar</td>
<td>19%</td>
<td>12%</td>
<td>7%</td>
<td>0%</td>
<td>2.50%</td>
<td>9%</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>0%</td>
<td>18%</td>
<td>5%</td>
<td>11%</td>
<td>5.47%</td>
<td>9%</td>
</tr>
<tr>
<td>Odisha</td>
<td>20%</td>
<td>12%</td>
<td>2.40%</td>
<td>0%</td>
<td>4.64%</td>
<td>9%</td>
</tr>
<tr>
<td>Goa</td>
<td>0%</td>
<td>12%</td>
<td>0%</td>
<td>8%</td>
<td>14%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Source: SERCs, News Reports
Operational Efficiency is driven by AT&C loss reduction

BILLING EFFICIENCY ➤ COLLECTION EFFICIENCY ➤ AT&C LOSSES ➤ IMPROVED PERFORMANCE OF DISCOMS

BENEFIT TO CONSUMERS
- Honest consumers do not pay for dishonest consumers
- Will avoid unreasonable tariff hike
North India

Billing Efficiency (%)  | Collection Efficiency (%)  | AT&C Losses (%)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Himachal Pradesh</td>
<td>104</td>
<td>94</td>
<td>49</td>
</tr>
<tr>
<td>Punjab</td>
<td>95</td>
<td>99</td>
<td>50</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>100</td>
<td>98</td>
<td>50</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>97</td>
<td>96</td>
<td>34</td>
</tr>
<tr>
<td>Haryana</td>
<td>104</td>
<td>91</td>
<td>34</td>
</tr>
<tr>
<td>Jammu &amp; Kashmir</td>
<td>104</td>
<td>99</td>
<td>49</td>
</tr>
</tbody>
</table>

Audited Figures for 2013-14
South India

Andhra Pradesh: Billing Efficiency (%), Collection Efficiency (%), AT&C Losses (%)
- Billing Efficiency: 89%
- Collection Efficiency: 95%
- AT&C Losses: 15%

Puducherry: Billing Efficiency (%), Collection Efficiency (%), AT&C Losses (%)
- Billing Efficiency: 87%
- Collection Efficiency: 97%
- AT&C Losses: 16%

Kerala: Billing Efficiency (%), Collection Efficiency (%), AT&C Losses (%)
- Billing Efficiency: 89%
- Collection Efficiency: 94%
- AT&C Losses: 16%

Karnataka: Billing Efficiency (%), Collection Efficiency (%), AT&C Losses (%)
- Billing Efficiency: 85%
- Collection Efficiency: 92%
- AT&C Losses: 22%

Tamil Nadu: Billing Efficiency (%), Collection Efficiency (%), AT&C Losses (%)
- Billing Efficiency: 78%
- Collection Efficiency: 99%
- AT&C Losses: 22%

Audited Figures for 2013-14
West India

Audited Figures for 2013-14

- **Goa**: Billing Efficiency 88%, Collection Efficiency 101%, AT&C Losses 11%
- **Maharashtra**: Billing Efficiency 86%, Collection Efficiency 100%, AT&C Losses 14%
- **Gujarat**: Billing Efficiency 85%, Collection Efficiency 99%, AT&C Losses 16%
- **Chattisgarh**: Billing Efficiency 76%, Collection Efficiency 102%, AT&C Losses 23%
- **Madhya Pradesh**: Billing Efficiency 75%, Collection Efficiency 96%, AT&C Losses 28%
East India

Audited Figures for 2013-14

- West Bengal: Billing Efficiency (68%), Collection Efficiency (100%), AT&C Losses (32%)
- Odisha: Billing Efficiency (64%), Collection Efficiency (95%), AT&C Losses (39%)
- Jharkhand: Billing Efficiency (66%), Collection Efficiency (87%), AT&C Losses (42%)
- Bihar: Billing Efficiency (56%), Collection Efficiency (96%), AT&C Losses (46%)
- Sikkim: Billing Efficiency (68%), Collection Efficiency (42%), AT&C Losses (71%)

Present
North East India

Billing Efficiency (%)  Collection Efficiency (%)  AT&C Losses (%)

Audited Figures for 2013-14
Audited Figures for 2013-14
# Potential Savings

<table>
<thead>
<tr>
<th>State</th>
<th>Input Energy 18-19 (Mkwh)</th>
<th>AT&amp;C Losses 13-14</th>
<th>AT&amp;C Loss Target by 18-19</th>
<th>Potential Saving if AT&amp;C Loss reduces to Target (Rs. Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haryana</td>
<td>55,788</td>
<td>34</td>
<td>15</td>
<td>5,391</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>1,08,378</td>
<td>25</td>
<td>15</td>
<td>5,227</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>79,170</td>
<td>27</td>
<td>15</td>
<td>4,654</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>68,848</td>
<td>28</td>
<td>15</td>
<td>4,486</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>1,08,438</td>
<td>22</td>
<td>15</td>
<td>3,986</td>
</tr>
<tr>
<td>Odisha</td>
<td>31,654</td>
<td>39</td>
<td>15</td>
<td>3,829</td>
</tr>
<tr>
<td>West Bengal</td>
<td>42,770</td>
<td>32</td>
<td>15</td>
<td>3,645</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>1,39,659</td>
<td>14</td>
<td>10</td>
<td>3,066</td>
</tr>
<tr>
<td>Bihar</td>
<td>18,259</td>
<td>46</td>
<td>15</td>
<td>2,861</td>
</tr>
<tr>
<td>Jammu &amp; Kashmir</td>
<td>16,447</td>
<td>49</td>
<td>15</td>
<td>2,808</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>1,15,826</td>
<td>15</td>
<td>10</td>
<td>2,764</td>
</tr>
<tr>
<td>Karnataka</td>
<td>77,430</td>
<td>22</td>
<td>15</td>
<td>2,717</td>
</tr>
<tr>
<td>Punjab</td>
<td>63,448</td>
<td>18</td>
<td>10</td>
<td>2,508</td>
</tr>
<tr>
<td>Gujarat</td>
<td>84,289</td>
<td>16</td>
<td>10</td>
<td>2,501</td>
</tr>
<tr>
<td>Jharkhand</td>
<td>11,608</td>
<td>42</td>
<td>15</td>
<td>1,577</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>52,019</strong></td>
</tr>
</tbody>
</table>

Assumption: (a) Targeted AT&C Loss for States with AT&C loss of >20% = 15.00 % and 10% for balance (b) Avg. Cost of Power Considered as INR 5.00/kwh
## Potential Savings

<table>
<thead>
<tr>
<th>State</th>
<th>Input Energy 18-19 (Mkwh)</th>
<th>AT&amp;C Losses 13-14</th>
<th>AT&amp;C Loss Target by 18-19</th>
<th>Potential Saving if AT&amp;C Loss reduces to Target (Rs. Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chattisgarh</td>
<td>27,424</td>
<td>23</td>
<td>15</td>
<td>1,120</td>
</tr>
<tr>
<td>Kerala</td>
<td>27,403</td>
<td>16</td>
<td>10</td>
<td>875</td>
</tr>
<tr>
<td>Delhi</td>
<td>37,691</td>
<td>14</td>
<td>10</td>
<td>771</td>
</tr>
<tr>
<td>Uttarakhand</td>
<td>15,452</td>
<td>19</td>
<td>10</td>
<td>696</td>
</tr>
<tr>
<td>Assam</td>
<td>8,804</td>
<td>30</td>
<td>15</td>
<td>671</td>
</tr>
<tr>
<td>Himachal Pr.</td>
<td>11,990</td>
<td>15</td>
<td>10</td>
<td>307</td>
</tr>
<tr>
<td>Arunachal Pr.</td>
<td>803</td>
<td>68</td>
<td>15</td>
<td>214</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>2,035</td>
<td>35</td>
<td>15</td>
<td>207</td>
</tr>
<tr>
<td>Sikkim</td>
<td>548</td>
<td>71</td>
<td>15</td>
<td>154</td>
</tr>
<tr>
<td>Puducherry</td>
<td>3,825</td>
<td>16</td>
<td>10</td>
<td>118</td>
</tr>
<tr>
<td>Manipur</td>
<td>792</td>
<td>44</td>
<td>15</td>
<td>113</td>
</tr>
<tr>
<td>Nagaland</td>
<td>854</td>
<td>38</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Tripura</td>
<td>1,375</td>
<td>28</td>
<td>15</td>
<td>88</td>
</tr>
<tr>
<td>Mizoram</td>
<td>612</td>
<td>33</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>Goa</td>
<td>4,721</td>
<td>11</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,505</strong></td>
<td></td>
<td></td>
<td><strong>57,523</strong></td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>57,523</strong></td>
</tr>
</tbody>
</table>
Improving billing efficiency through metering and Tracking of losses

<table>
<thead>
<tr>
<th>Activity</th>
<th>Benefit</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory feeder and Distribution Transformer (DT) metering by States</td>
<td>Ability to track losses at the feeder and DT level for corrective action</td>
<td>Feeders - 30th Jun 2016 DTs – 30th Jun 2017</td>
</tr>
<tr>
<td>Consumer Indexing &amp; GIS Mapping of losses</td>
<td>Identification of loss making areas for corrective action</td>
<td>30th Sep 2018</td>
</tr>
</tbody>
</table>
## Infra augmentation & Smart Metering

<table>
<thead>
<tr>
<th>Activity</th>
<th>Benefit</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 a) Upgrade or change transformers, meters etc.</td>
<td>Reduce technical losses and minimize outages</td>
<td>31&lt;sup&gt;st&lt;/sup&gt; Dec 2017</td>
</tr>
<tr>
<td>2 b) Smart metering of all consumers consuming above 200 units / month</td>
<td>Smart meters will be tamper proof and allow remote reading thus helping reduce theft</td>
<td>Consumption &gt; 500 units / month - 31&lt;sup&gt;st&lt;/sup&gt; Dec 2017 Others – 31&lt;sup&gt;st&lt;/sup&gt; Dec 2019</td>
</tr>
</tbody>
</table>
## Improving collection efficiency through public participation

<table>
<thead>
<tr>
<th>Activity</th>
<th>Benefit</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness campaign against theft to ensure “honest do not pay for dishonest”</td>
<td>Enhance public participation to reduce power theft</td>
<td>One year awareness programme jointly with States up to 31st December 2016</td>
</tr>
<tr>
<td>Assure increased power supply in areas where the AT&amp;C losses reduce</td>
<td>Encourage local participation to reduce losses</td>
<td>31st March 2018</td>
</tr>
</tbody>
</table>
'Mhara Gaon - Jagmag Gaon‘ – Haryana’s Scheme to reduce loss

<table>
<thead>
<tr>
<th>Details</th>
<th>Hours of Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>12</td>
</tr>
<tr>
<td>Identified villages with 25-70% losses</td>
<td>15</td>
</tr>
<tr>
<td>Install meters outside houses and replace old wires</td>
<td>18</td>
</tr>
<tr>
<td>After bill payment crosses the mark of 90%</td>
<td>21</td>
</tr>
<tr>
<td>Outstanding amount of electricity bills paid in five equal instalments</td>
<td>24</td>
</tr>
</tbody>
</table>
## Demand Side Management to improve efficiency

<table>
<thead>
<tr>
<th>Activity</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand Side Management (DSM) with energy efficient equipment (by 18-19):</td>
<td>Reduce peak load and energy consumption</td>
</tr>
<tr>
<td>• LED bulbs: 77 cr. HH bulbs &amp; 3.5 cr. streetlights</td>
<td>45,000 cr.</td>
</tr>
<tr>
<td>• Agricultural pumps – 1 crore</td>
<td>12,000 cr.</td>
</tr>
<tr>
<td>• Fans &amp; Air-conditioners – 16 cr. Fans &amp; 18 lakh A/Cs</td>
<td>1,500 cr.</td>
</tr>
<tr>
<td>• Industrial equipment through PAT (Perform, Achieve, Trade)</td>
<td>7,600 cr.</td>
</tr>
</tbody>
</table>
**National Domestic LED Programme**

<table>
<thead>
<tr>
<th>Domestic Efficient Lighting Programme (DELP)</th>
<th>Target</th>
<th>Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of LED bulbs to be replaced</td>
<td>77 crore</td>
<td>2.5 crore</td>
</tr>
<tr>
<td>No of towns where work in progress/complete</td>
<td>Entire country</td>
<td>78/7 = 85</td>
</tr>
<tr>
<td>Annual energy savings</td>
<td>105 b KWh</td>
<td>3.16 b KWh</td>
</tr>
<tr>
<td>Reduction of peak load</td>
<td>20,000 MW</td>
<td>802 MW</td>
</tr>
<tr>
<td>Annual reduction in consumer bills</td>
<td>Rs. 40,000 cr</td>
<td>Rs. 1,264 cr</td>
</tr>
<tr>
<td>Annual reduction in GHG emission</td>
<td>79 mn ton CO₂</td>
<td>5.5 mn ton of CO₂</td>
</tr>
</tbody>
</table>

**Innovative Service Model** - entire upfront investment made by EESL and recovered by sharing energy savings over the project period (DELP: 10 months)
Transparency in Procurement - Reduction in Price

Large scale and transparent procurement has led to sharp decline in LED bulb prices (with taxes)

- Specs improved from 7W to 9W
- Retail price of LED bulbs reduced by almost 50% (Rs. 599 to Rs. 317)
- For street lights – prices have come down from Rs. 137 per watt to Rs. 85 per watt
Energy Conservation through PAT

• PAT (Perform, Achieve & Trade) - Energy-intensive industries achieve reduction in specific energy consumption (per unit production)

<table>
<thead>
<tr>
<th>PAT Cycle</th>
<th>Number of Sectors</th>
<th>% of national energy consumption covered</th>
<th>Reduction in specific energy consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-15</td>
<td>8</td>
<td>30%</td>
<td>4%</td>
</tr>
<tr>
<td>2016-19</td>
<td>11</td>
<td>50%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Cost reduction through Central Support

- Ministry of Power constituted two committees to facilitate States for mobilizing major equipment
  - Committee-A, headed by the Chairperson, CEA, entrusted with the task of
    - listing out major equipment/material,
    - finalize technical specifications,
    - aggregate requirement of various states.
  - Committee B, headed by Director (Projects) PGCIL, was entrusted
    - prepare bidding documents,
    - carry out bid processing through e-tendering under reverse bidding mode,
    - evaluate bids and finalize rate contracts.
## Equipment Installation

<table>
<thead>
<tr>
<th>Area</th>
<th>Units Installed (lakh)</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeder &amp; DT Meters</td>
<td>13</td>
<td>2017</td>
</tr>
<tr>
<td>Smart Meters &gt; 500 units/ mth</td>
<td>100</td>
<td>2017</td>
</tr>
<tr>
<td></td>
<td>250</td>
<td>2019</td>
</tr>
<tr>
<td>Smart Meters 200-500 units/ mth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DT</td>
<td>4.2</td>
<td>2017</td>
</tr>
<tr>
<td>Conductors</td>
<td>11.2</td>
<td>2017</td>
</tr>
<tr>
<td>LED Bulbs Domestic Streetlights</td>
<td>7,700</td>
<td>2019</td>
</tr>
<tr>
<td></td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>Eff. Agri Pumps</td>
<td>100</td>
<td>2019</td>
</tr>
<tr>
<td>Appliances</td>
<td>1,600</td>
<td>2019</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>
Reducing Cost of thermal Power

• Increased supply of domestic coal – 200 mt – Rs 20,000 cr.

• Coal linkage rationalization – 500 mt – Rs 6,000 cr.

• Liberally allowing coal swaps from inefficient plants to efficient plants and from plants situated away from mines to pithead plants to minimize cost of coal transportation – Rs 10,000 cr.

• Coal price rationalization based on Gross Calorific Value (GCV)*

• Correction in Coal grade slippage through re-assessment of each mine*

* Correct tariff fixation and reduce coal theft
Coal India production increase

INCREASE IN PROD. 2014-15 (One Year) - 31.59 Million Metric Ton per Annum (MMT)

INCREASE IN PROD. IN LAST 6 YEARS 2008-14: 83 MMT
PLANNED INCREASE IN NEXT 6YRS 2014-20: 537.59 MMT


* 1 Bn with additional allocation of mines
# Illustration of Savings - NTPC

<table>
<thead>
<tr>
<th>Area</th>
<th>Savings (Rs. Cr.)</th>
<th>Per Unit Savings (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substituting imported coal, MoU/E-Auction coal by 100% ACQ coal</td>
<td>7,300</td>
<td>0.30</td>
</tr>
<tr>
<td>Rationalization / swapping of coal sources including freight charges</td>
<td>1,270</td>
<td>0.05</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,570</strong></td>
<td><strong>0.35</strong></td>
</tr>
</tbody>
</table>
Reducing Cost of Power

- Completion of railway lines
- JV’s with States
- Coal India to supply 100% washed coal for G10 grade and above at plants > 500 km from mines by 1st October 2018
- 100% crushed coal from Coal India by 1st Apr 2016
- Faster completion of delayed transmission lines
- New transmission lines expedited planned for 2030 requirement
- Award of works of about Rs. 1 lakh crore by 31st March 2016
Transmission Capacity Addition

- Highest ever increase in Transmission lines & substation capacity since May 2014 (36,000 ckm and 90,000 MVA respectively as on Oct 2015)
- Inter-regional power transfer
  - 765 kV Gwalior-Jaipur D/C and 765 kV Jaipur-Bhiwani lines saving 10 cr/ day
  - 765kV Aurangabad-Sholapur will enhance transfer capacity by 1700MW
- Additional 18,400 MW to Southern Corridor expected by 2018-19 (thrust on reconducting of existing lines)
- Transmission loss presently in the range of 4-5 %, reduce by at least 1%
DISCOM in a debt trap

• DISCOM debt interest rate – Average ~ 12%, as high as 14-15% for many DISCOMs while States borrow at ~ 8%
• Regulators don’t allow pass through of interest on past losses in tariff
• Surgical intervention required to rationalise outstanding debt
State takeover of DISCOM debt

• DISCOM debt is de facto borrowing of States which is not counted in de jure borrowing

• States shall take over 75% of DISCOM debt as on 30 September 2015

<table>
<thead>
<tr>
<th></th>
<th>2015-16</th>
<th>2016-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt taken over</td>
<td>50%</td>
<td>25%</td>
</tr>
</tbody>
</table>

• Principal debt taken over will not be included in fiscal deficit of States. However, interest has to be serviced within FRBM limits

• States will issue non-SLR bonds (SDL) with maturity period of 10-15 years with a moratorium on principal up to 5 years
State bond pricing

• 10 year Bond Pricing: 7.92% (as per last RBI auction of State SDLs) + 0.25% spread for non-SLR status on semi-annual compounding basis (market driven, subject to cap of 10 yr. G-Sec + 50 + 25 bps)
Debt takeover mechanism

- Debt of DISCOM will be taken over in the priority of debt already due, followed by debt with highest cost.
- Transfer to DISCOM by State will be as grant with an option to spread the grant over three years.*

* MoP can further relax by 2 years for high debt States like Raj and TN.
### State takeover of DISCOM debt

#### Illustration

<table>
<thead>
<tr>
<th></th>
<th>As on 30 Sep, 2015</th>
<th>2015-16</th>
<th>2016-17</th>
<th>2017-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISCOM Debt</td>
<td>40,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt taken over by State</td>
<td></td>
<td>20,000</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Option A) 2yr Grant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grant</td>
<td></td>
<td>20,000</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Option B) 3 yr Grant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grant</td>
<td></td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Loan from State to DISCOM (at same rate as State borrowing)</td>
<td>10,000</td>
<td></td>
<td>-10,000</td>
<td></td>
</tr>
</tbody>
</table>
Treatment of residual debt

• Up to 25% of the grant can be given as equity
• DISCOM debt to be taken over by the State will include DISCOM bonds which are committed to be taken over by the State as part of FRP 2012 including bonds already taken over in 2015-16
• Residual DISCOM debt to be converted into bonds to be offered to market at a likely rate of State Bond + 0.2%. If not converted into bonds, Banks can lend at < Base rate + 0.1%
• Scheme available only for State DISCOMs including combined generation, transmission and distribution undertakings
Complying with RPO obligations

• DISCOMs to comply with the Renewable Purchase Obligation (RPO) outstanding since 1st April, 2012, within a period to be decided in consultation with MoP
• Clear large number of RPOs with developers
• Impetus to clean energy markets
Ongoing DISCOM financing

• Loss financing only as per loss trajectory finalized with MoP and only through DISCOM bonds backed by State guarantee

• Working capital will only be allowed up to 25% of the DISCOM’s previous year’s annual revenue
States will fund the future losses (if any) of DISCOMs in a graded manner

<table>
<thead>
<tr>
<th>Year</th>
<th>2015-16</th>
<th>2016-17</th>
<th>2017-18</th>
<th>2018-19</th>
<th>2019-20</th>
<th>2020-21 ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Year’s DISCOM loss to be taken over by State</td>
<td>0% of the loss of 2014-15</td>
<td>0% of the loss of 2015-16</td>
<td>5% of the loss of 2016-17</td>
<td>10% of the loss of 2017-18</td>
<td>25% of the loss of 2018-19</td>
<td>50% of the previous year loss</td>
</tr>
</tbody>
</table>

Ensures permanent resolution of DISCOM issues through a hard budget constraint
Additional Benefits for States

• States accepting the scheme and performing as per operational milestones will be given additional / priority funding through DDUGJY, IPDS, Power System Development Fund (PSDF) or other such schemes of MoP and MNRE

• Such States shall also be supported with additional coal at notified prices and, in case of availability through higher capacity utilization, low cost power from NTPC and other Central Public Sector Undertakings (CPSUs)
Outcomes – Breakeven in next 2-3 years

• Reduction of AT&C loss to 15% in 2018-19

• Reduction in gap between Average Revenue Realized (ARR) & Average Cost of Supply (ACS) to zero by 2018-19

• Almost all DISCOMs to be profitable by 2017-18, 3-4 by 2018-19
MoU to be signed between MoP, State and DISCOM(s)

- Clear identification of responsibilities of each of the three parties
- Details of specific operational activities to be undertaken in the State
- Circle level targets of loss reduction with responsibilities, resources and timelines
- MoU targets to be reviewed on a monthly basis by MoP
Benefits of UDAY - Government

• Achievement of 24X7 Power for All
• Power to 5 crore households without electricity
• Speedy achievement of electrification of remaining 18,500 villages
• Energy security through coal and renewables
• Reduce Current Account Deficit (CAD) from higher diesel import (current annual imports of around Rs. 50,000 crore)
• Meet ambitious renewable energy commitments as a responsible global citizen
• Revive investments in power sector to create jobs
Benefits of UDAY – Industry & Consumers

• Availability of 24X7 power improving quality of life and efficiency

• Lower cost of power - Typical 3,000 MW NTPC plant running at 60% Plant Load Factor (PLF) has a fixed cost of Rs. 2.67 / unit, vs Rs. 1.80 at 90% PLF

• Global competitiveness of industry
Benefits of UDAY – Banks & Investors

• Avoid banking contagion (Rs, 40,000 crore of repayments due to banks in 2015-16) which will create significant NPAs
• Lower risk for existing investments and loans in power, coal and renewables sector
• Lower capital adequacy
• Increased procurement of power by DISCOMs revives existing power projects suffering from low PLFs
• Reduce investment uncertainty across the sector
## Efficiency Improvement Benefits

<table>
<thead>
<tr>
<th>Area</th>
<th>Details</th>
<th>Amount (Rs. Cr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Rate Reduction</td>
<td>3% on 25% DISCOM debt 4% on 75% DISCOM debt</td>
<td>17,000</td>
</tr>
<tr>
<td>Debt takeover by State</td>
<td>8% on 75% DISCOM debt</td>
<td>27,000</td>
</tr>
<tr>
<td>AT&amp;C loss reduction</td>
<td>Reduce to 15-10%</td>
<td>57,500</td>
</tr>
<tr>
<td>Supply of domestic coal and coal swapping</td>
<td></td>
<td>36,000</td>
</tr>
<tr>
<td>DSM</td>
<td>LED, Appliances etc.</td>
<td>58,500</td>
</tr>
<tr>
<td>PAT</td>
<td></td>
<td>7,600</td>
</tr>
<tr>
<td>Transmission Losses</td>
<td>1% of Intra State</td>
<td>1,600</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>2,05,200</strong></td>
</tr>
</tbody>
</table>
Other Initiatives in the Distribution Sector
DeenDayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

- Electrify all 18,452 remaining un-electrified villages in the country
- Access of electricity to remaining 5 crore Households
- System Strengthening:
  - Power transformers: 14,491 nos.
  - Distribution transformers: 3,17,068 nos.
  - Conductors: 8,69,521 kms
  - Energy Meters: 110,00,000 nos.
- Metering the un-metered
  - Feeder/Boundary/ DTs: 11,92,658 nos.

**Total Outlay approved for DDUGJY including RE Component is Rs. 75,893 crores**
Integrated Power Development Scheme (IPDS)

An integrated scheme for urban areas covering:
- Smart Metering and Tamper-proof meters at homes
- Infrastructure upgradation in urban areas - Comprehensive sub transmission & distribution
- Underground cabling & GIS Sub stations in densely populated areas
- IT implementation for better customer service
- Solar installations like rooftop solar panels also covered
- Outlay of Rs. 65,424 crores
Grant under DDUGJY and IPDS

• Total outlay of Rs 1.4 lakh crore

• Incentive based grant to States of Rs 9,178 crores linked to:
  
  ➢ Timely completion of the scheme

  ➢ Reduction in At &C looses as per the agreed trajectory

  ➢ Upfront release of admissible revenue subsidy by the State Government to DISCOM based on metered consumption.
Impact of IT enablement

- 1st of its kind Impact Assessment of IT enablement under IPDS

- Estimated savings through AT&C loss reduction could be INR 5000 Cr

- 1114 towns out of 1409 towns declared Go-Live

- 19 out of 21 Data Centers Operational

- 22 SCADA Control Centers commissioned
DDUGJY – Emphasis on Sustainability of DISCOMs with renewed focus on rural electrification has fastened the process from 2015 onwards. Expected to electrify all villages by 2017.
12 Stage Monitoring

1. Survey Report
2. Receipt of Poles
3. Erection of Poles (11 KV)
4. Erection of Poles (LT)
5. Receipt of DT
6. Stringing (LT)
7. Stringing (11KV)
8. Receipt of Line Material
9. Erection of DT
10. Completion of Works
11. Inspection
12. Energisation
Grameen Vidyutikaran App

- **Total Villages**: 18,452
- **Electrified**: 2,101
- **To be Electrified**: 16,351
- **To be Electrified Stages**:
  - **To be started**: 15,103
  - **Surveyed**: 183
  - **Under Progress**: 228
  - **Under Energization**: 837
- **GRID**: 15,236
- **Electrified**: 2,079
- **To be Electrified**: 13,157

**Achieved**

- **Achieved**: 32,120
- **Percentage**: 15%
- **Days Left**: 567

**Progress Last 4 weeks**

- Chart showing progress from 10-Oct to 19-Sep.

**Milestone**

- **M1**: Yes
- **Report Approved**: 15-08-2015

- **M2**: No
- **Report Approved**: 10-09-2015
Distributed Decentralized Generation (DDG)

- For remote locations, DDG provides operational ease
- Potential to lower overall carbon footprint by maximizing clean local generation
- Can operate in a standalone mode and interconnected with the central grid when available.
- Allows for community engagement in electricity supply
- Infrastructure should be Grid compatible
- Cost components include all equipments and accessories, civil works, O&M for 5 years
Recent amendments in DDG guidelines

- Standalone system permitted under DDUGJY
- Standalone system shall include 200 watt SPV panel, inverter, battery, internal wiring, LEDs etc.
- 2500 Unelectrified villages under microgrid and 1000 villages to be covered under Standalone.
- Avg. cost per HH is Rs.0.56 lakhs
- Nearly 3 lacs households to be covered
- Tender to be floated centrally to take advantage of Economies of scale
- Specifications being finalized by MNRE and REC.
- Reverse auction methodology to be adopted.
A New Realm of Possibilities for Rural India
Proposed Policy Interventions
Proposed amendments in the Electricity Act

• Segregation of carriage from content

• Accelerate electricity generation from renewable energy sources

• Strengthening grid safety and security

• Rationalize tariff determination process

• Review of performance of Regulatory Commissions.

• Provide for recovery of revenue by Licensees without any revenue gap

• Mandate to Regulators for suo moto proceedings in determination of tariff (in case the utility companies do not file their petitions in time)
Suggested Amendments in Tariff Policy

• Expansion of existing power plants owned by states permitted for optimum utilization of existing infrastructure.
• Expansion of private developers up to 100% from existing capacity; policy for private sector to be decided in 6 months.
• Setting up Coal washery rejects based projects on Cost plus basis by the PSUs,
• Renewable Energy Generation Obligation (RGO) on all future coal and lignite based thermal station to be set up.
• Renewable energy estimated to be 15% of total energy consumption by 2022 (up from 6% now)
• Compulsorily procurement of power from “Waste to Energy”
• Procured waste water to be used in thermal plants in the vicinity of towns & cities.
• Regulatory Commission to devise a trajectory to ensure 24 hours supply of adequate and uninterrupted power to all categories of consumers
Renewable Energy Initiatives
Road Map for Renewable Power by 2022

175 GW

100 GW
- Solar

60 GW
- Wind

5 GW
- Small Hydro

10 GW
- Biomass & Others
# Renewable Investments by 2022

<table>
<thead>
<tr>
<th>Area</th>
<th>Solar</th>
<th>Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Capacity (GW) (approx.) (as on Oct’15)</td>
<td>4.4</td>
<td>24</td>
</tr>
<tr>
<td>Target Capacity by 2022 (GW)</td>
<td>100 (Ground mounted – 60 &amp; Roof top - 40)</td>
<td>60</td>
</tr>
<tr>
<td>Investment Already Made (USD billion) (approx.)</td>
<td>5.5</td>
<td>22</td>
</tr>
<tr>
<td>Additional Investment to be made by 2022 (USD billion) (approx.)</td>
<td>80</td>
<td>30</td>
</tr>
</tbody>
</table>
Solar Power price reduction to achieve Grid Parity

* 500 MW bought by NTPC through Reverse e bidding on 4th Nov at midnight
Total Investment Potential (by 2022)

<table>
<thead>
<tr>
<th>Area</th>
<th>Potential (USD Bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewables</td>
<td>120</td>
</tr>
<tr>
<td>Generation (CPSUs, States, UMPPs &amp; Private Sectors)</td>
<td>50</td>
</tr>
<tr>
<td>Transmission</td>
<td>50</td>
</tr>
<tr>
<td>Sub Transmission &amp; Distribution</td>
<td>25</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
</tr>
</tbody>
</table>
Sabka Saath, Sabka Vikas

Thank You

http://www.ujwalbharat.gov.in/