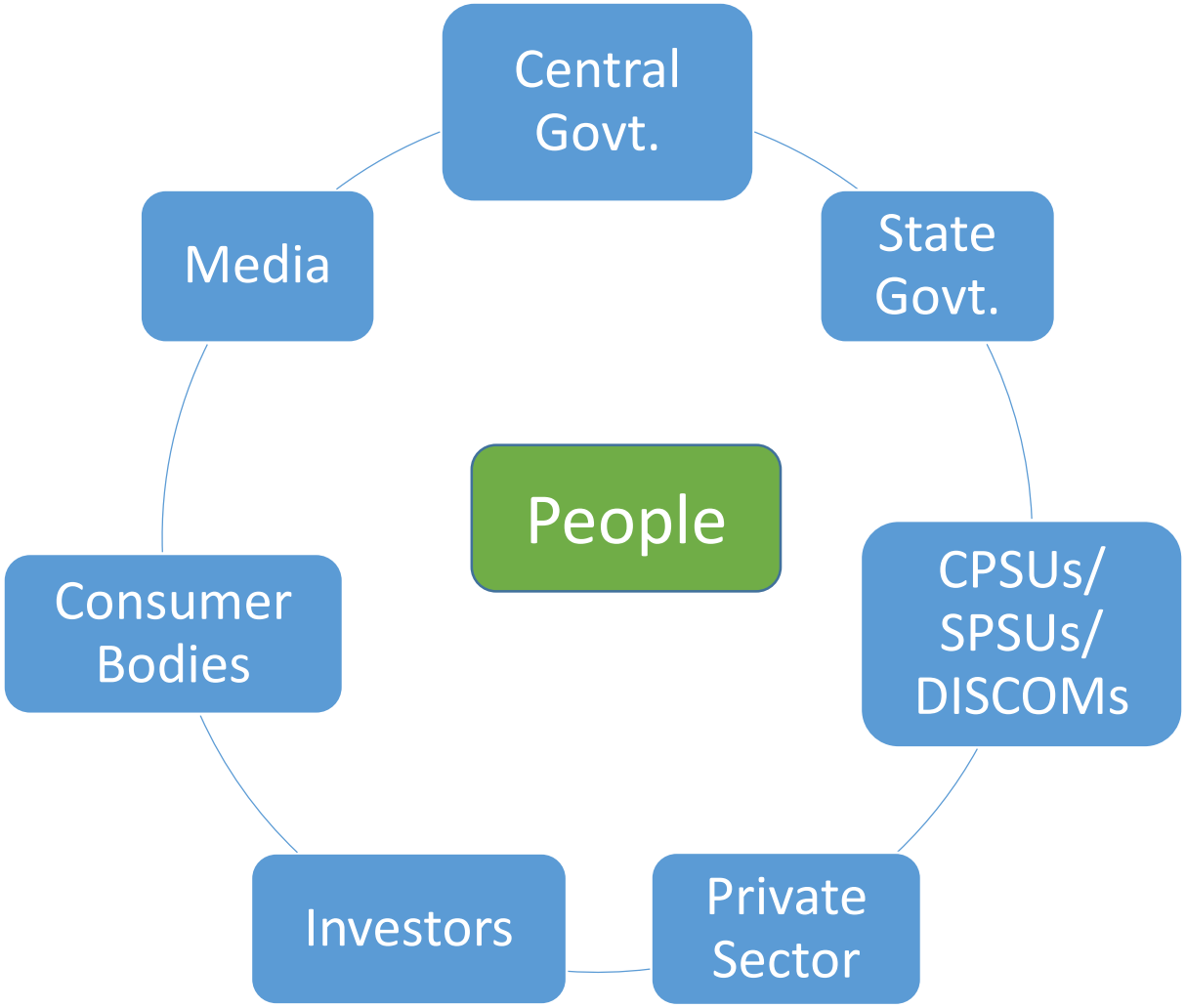
Towards Ujwal Bharat
UDAY: The Story of Reforms

9th November, 2015

सबका साथ
सबका विकास

UJWAL BHARAT

Team India to serve 125 crore people

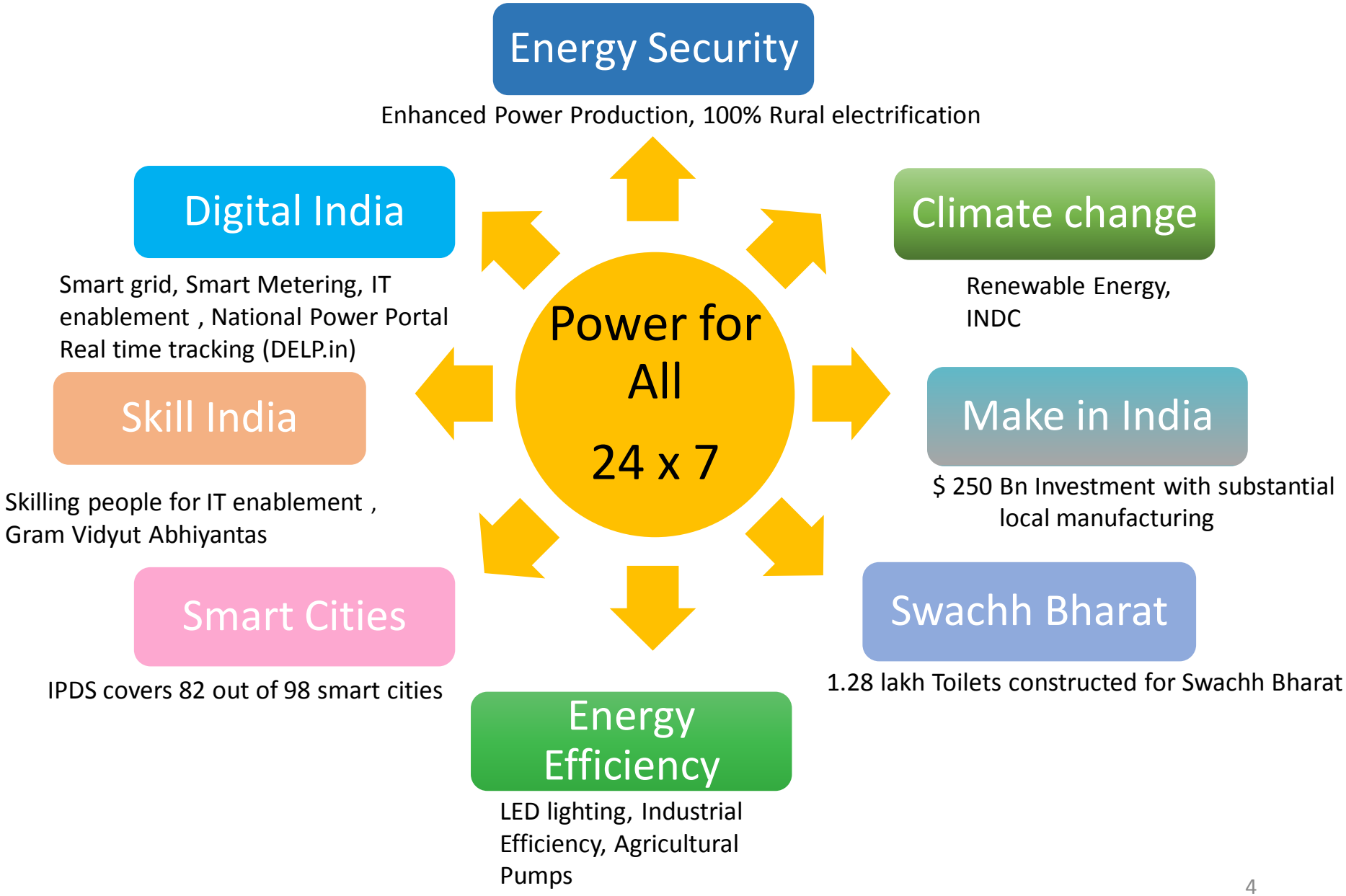


Ministry of Power

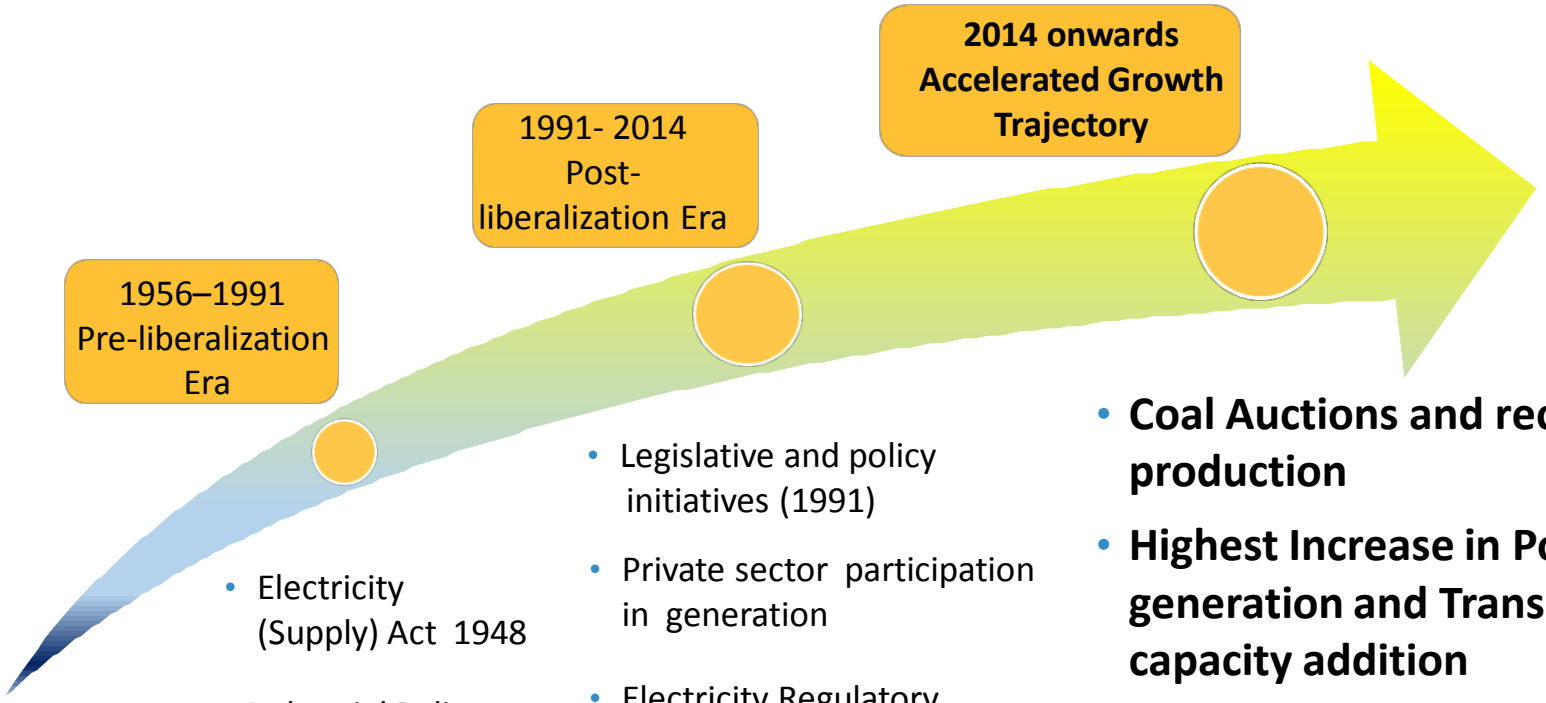
Ministry of Coal

Ministry of N&RE

INTEGRATED APPROACH


Energy Security
Enhanced Power Production, 100% Rural electrification
Digital India
Smart grid, Smart Metering, IT enablement , National Power Portal Real time tracking (DELP.in)
Climate change
Renewable Energy, INDC
Power for All
24 x 7
Skill India
Skilling people for IT enablement , Gram Vidyut Abhiyantas
Make in India
$ 250 Bn Investment with substantial local manufacturing
Smart Cities
IPDS covers 82 out of 98 smart cities
Swachh Bharat
1.28 lakh Toilets constructed for Swachh Bharat
Energy Efficiency
LED lighting, Industrial Efficiency, Agricultural Pumps

Power Sector Reforms



from Darkness

- 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**

Guiding Principles - TRANSPARENCY

- **T**echnology Focus
- **R**oot Cause Analysis
- **A**ccountability
- **N**ational Effort – Team India
- **S**peed, Skill and Smart
- **P**rioritization
- **A**chievement Oriented
- **R**ejuvenate Economic Growth
- **E**fficiency & Economies of Scale
- **N**ational Sustainable Development
- **C**ustomer Focus
- **Y**es We Can

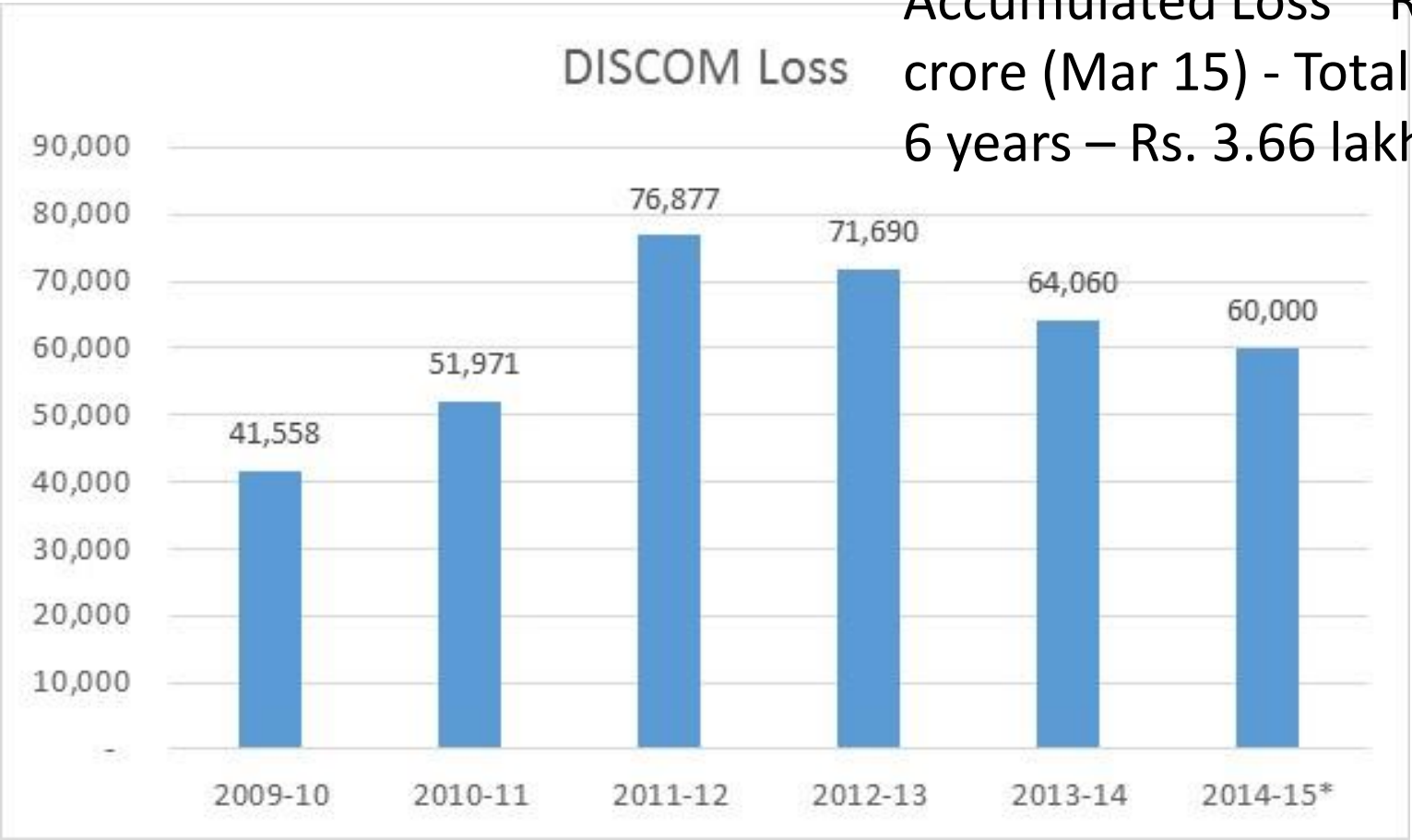
24x7 Power For All

Power Value Chain

DISCOMs are the weakest link in providing 24X7 Power for All

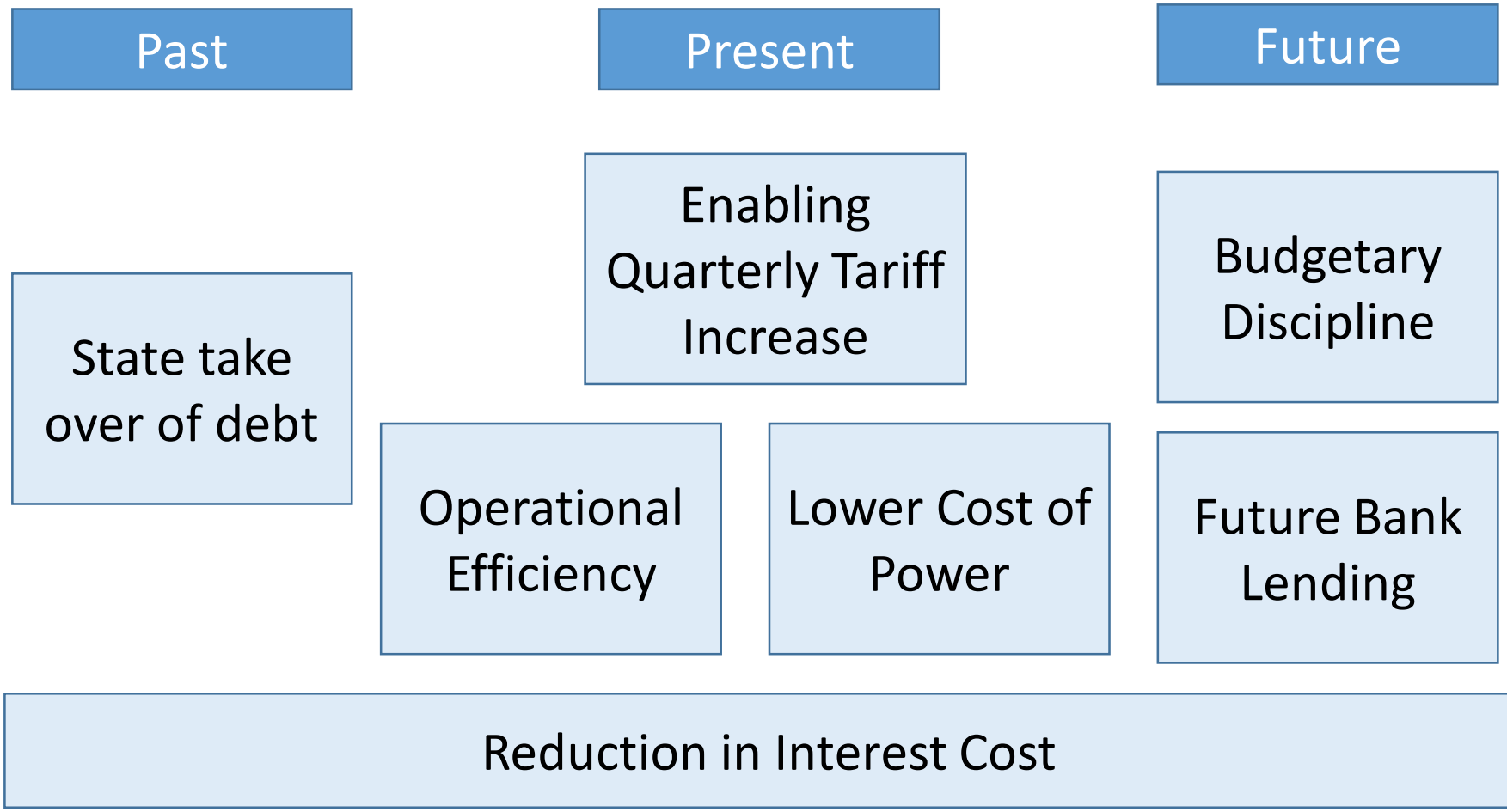
Accumulated DISCOM losses & debt have ballooned in the last few years

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



Stage wise Tariff Increase

Activity	Benefit	End Date
Enabling provision for quarterly revision to mitigate cost increase burden	Such periodic tariff revision will be easier to implement and absorb by consumers	Necessary changes in tariff policy in a month

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%

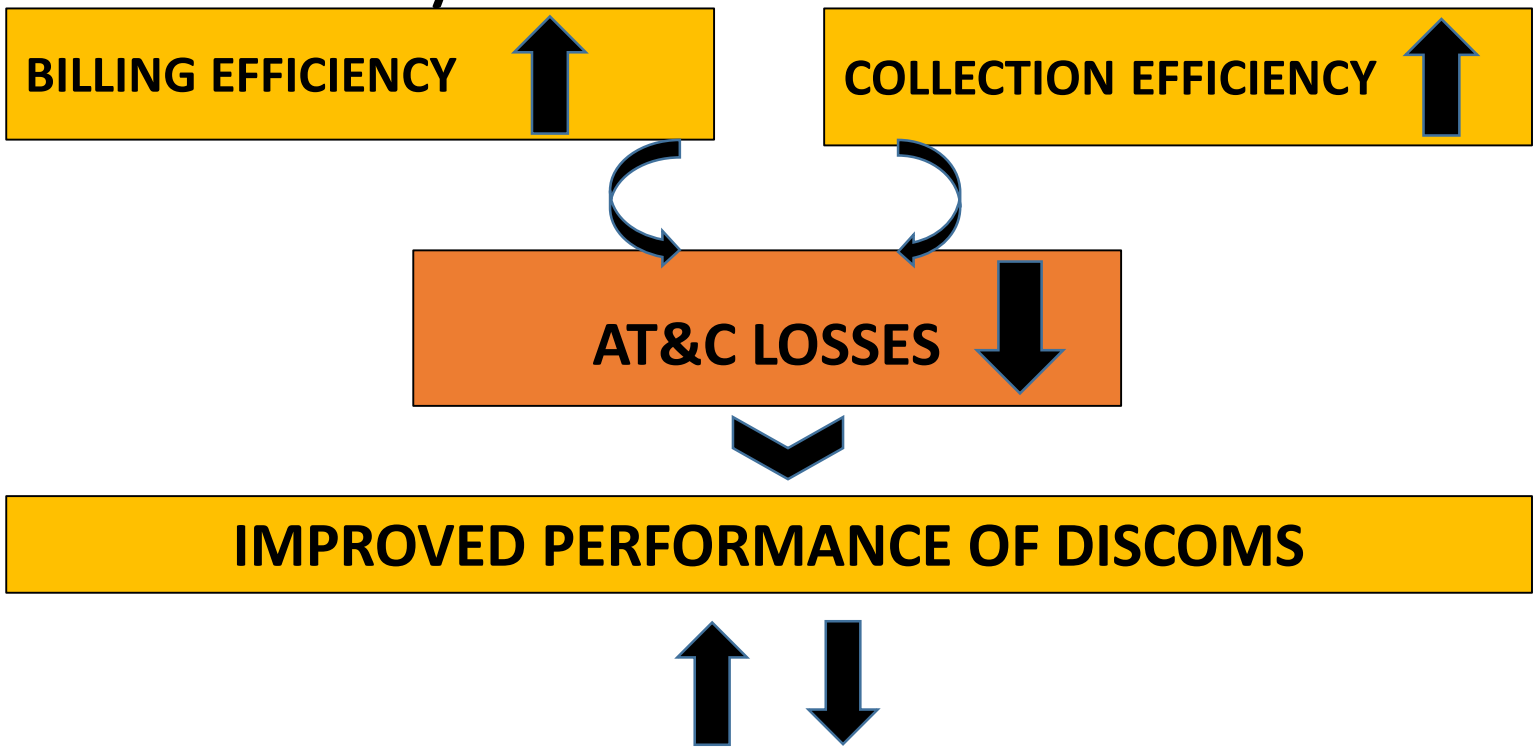
Tariff increase not the only solution to DISCOM distress

Higher than National Average Tariff Hikes

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

Source: SERCs, News Reports

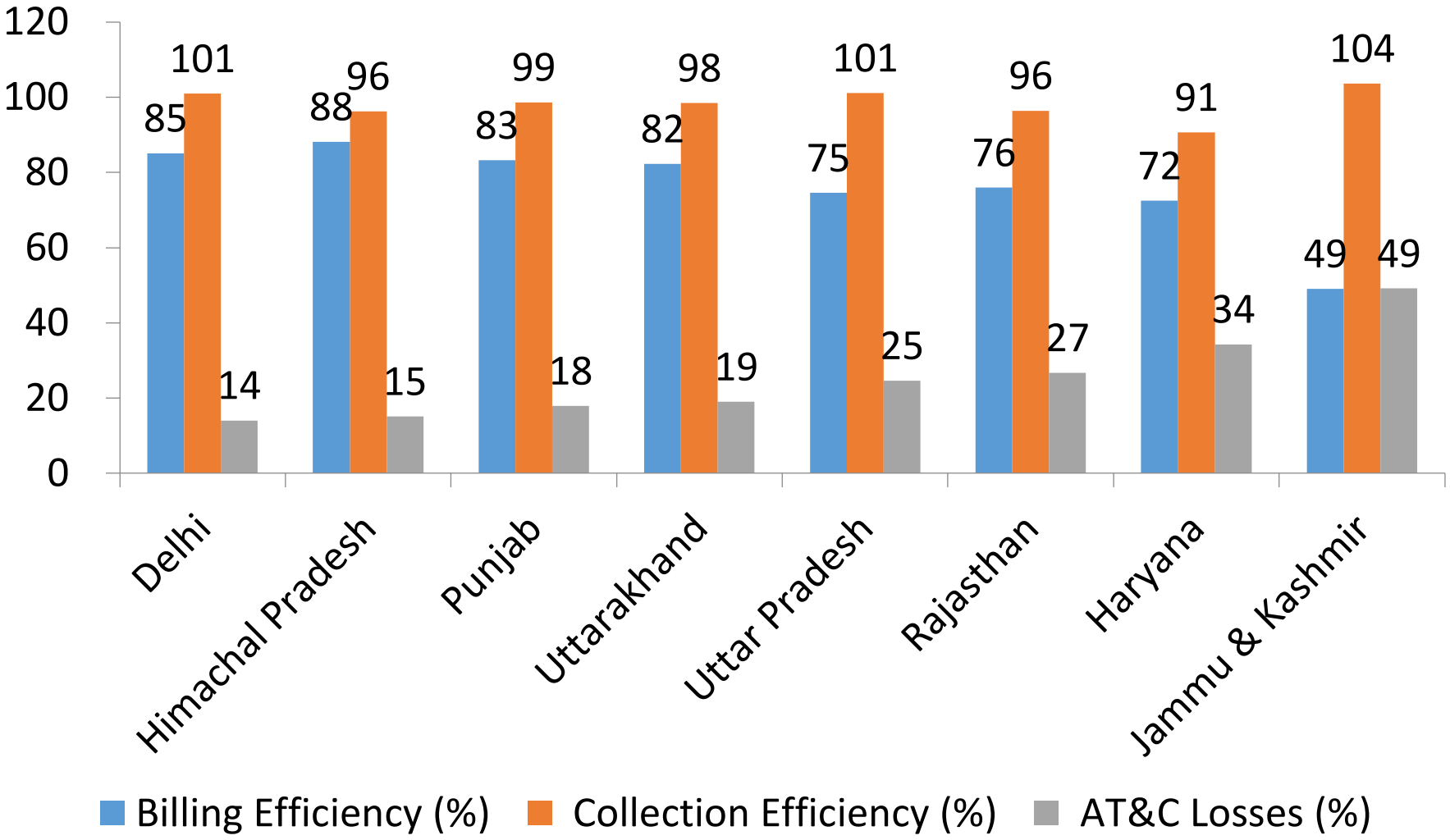
Operational Efficiency is driven by AT&C loss reduction



BENEFIT TO CONSUMERS

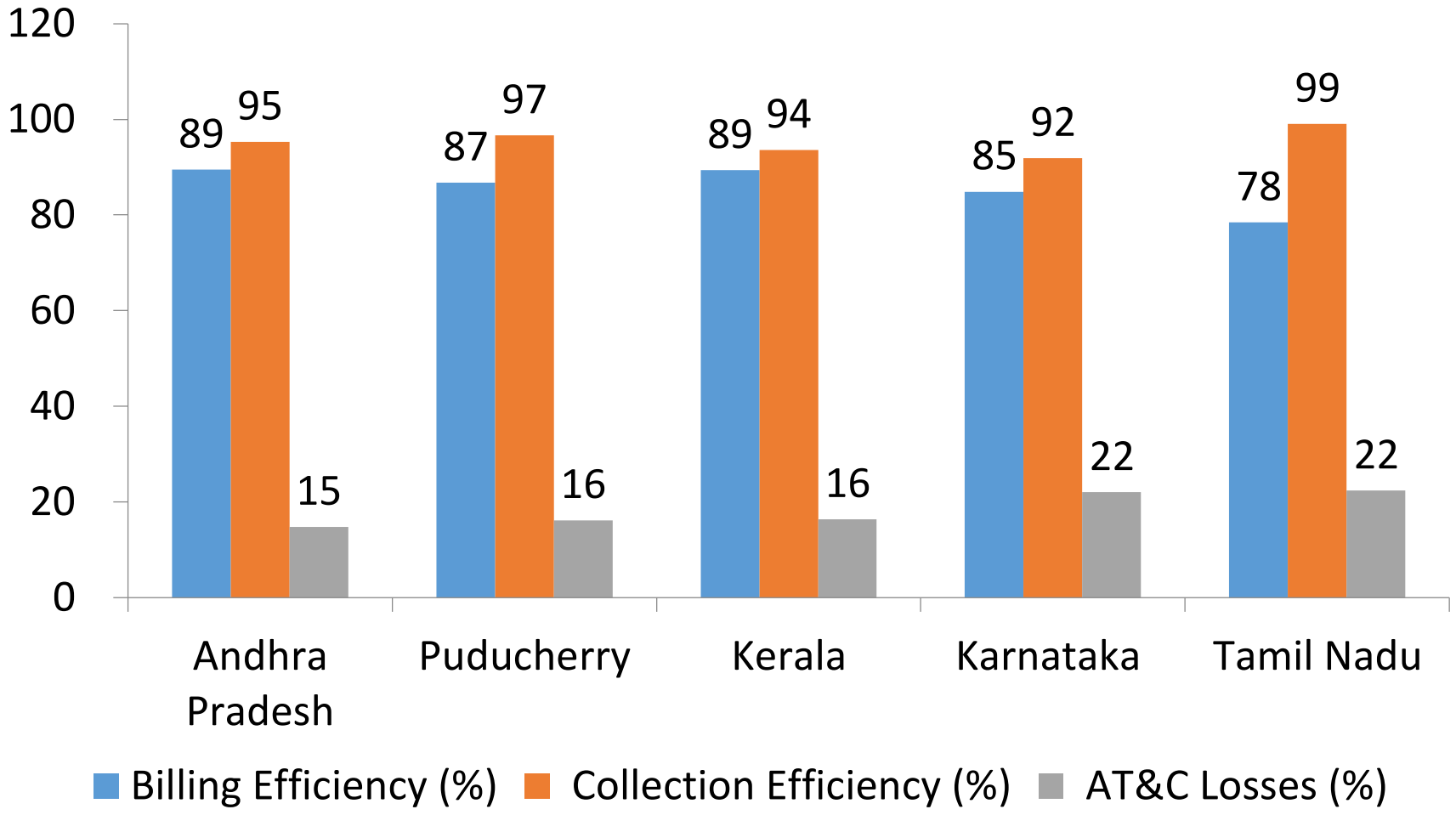
- **Honest consumers do not pay for dishonest consumers**
- **Will avoid unreasonable tariff hike**

North India



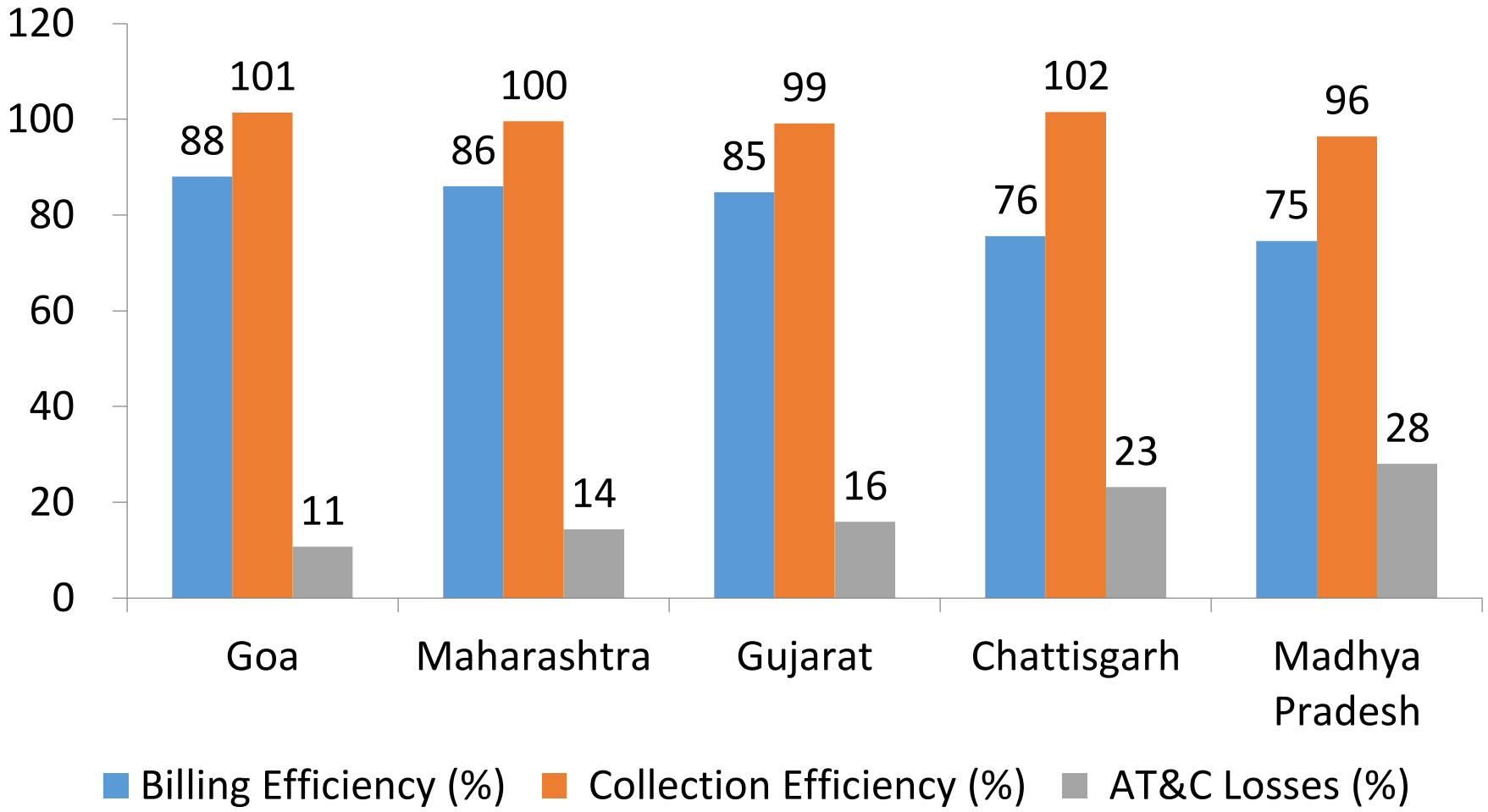
Audited Figures for 2013-14

South India



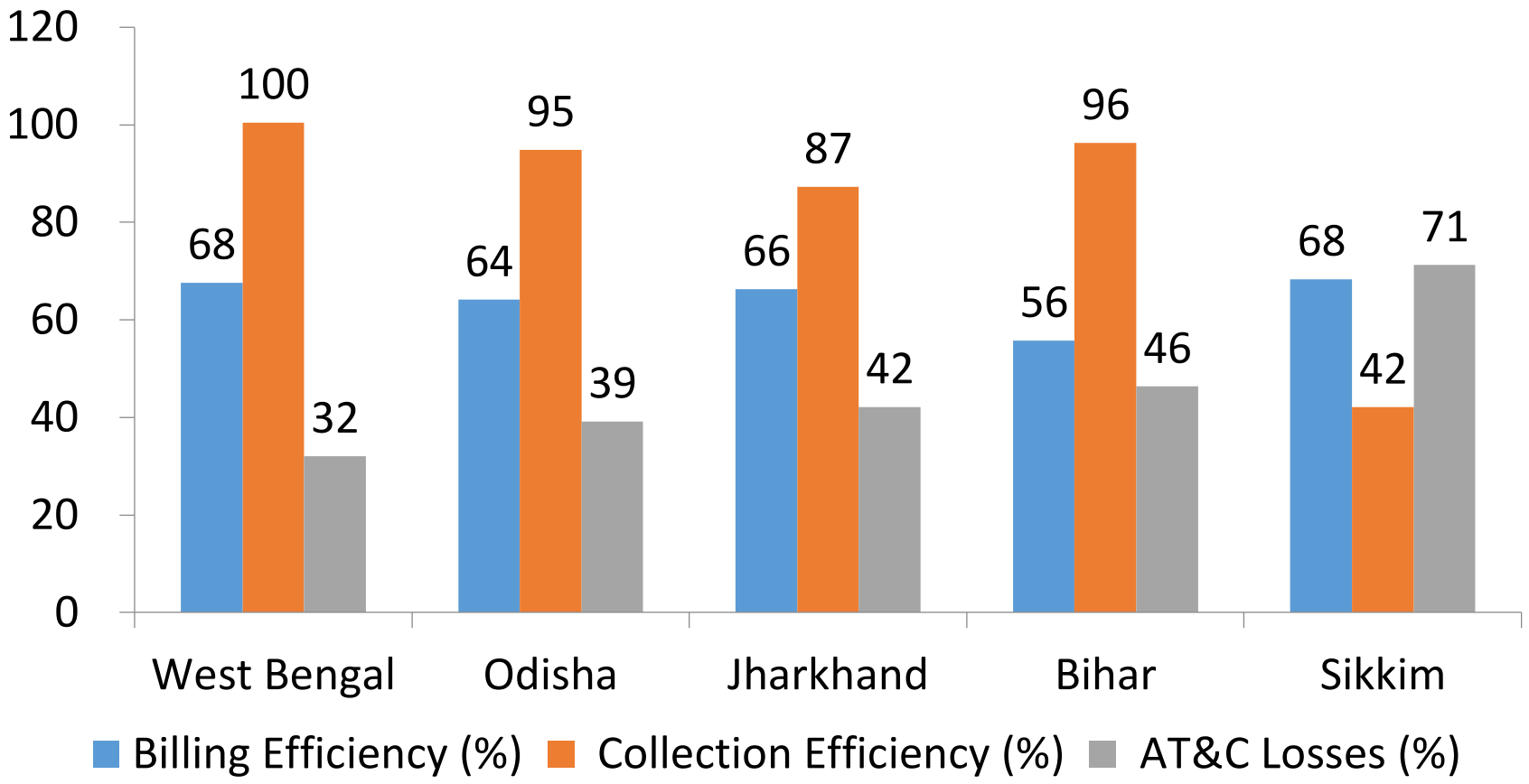
Audited Figures for 2013-14

West India



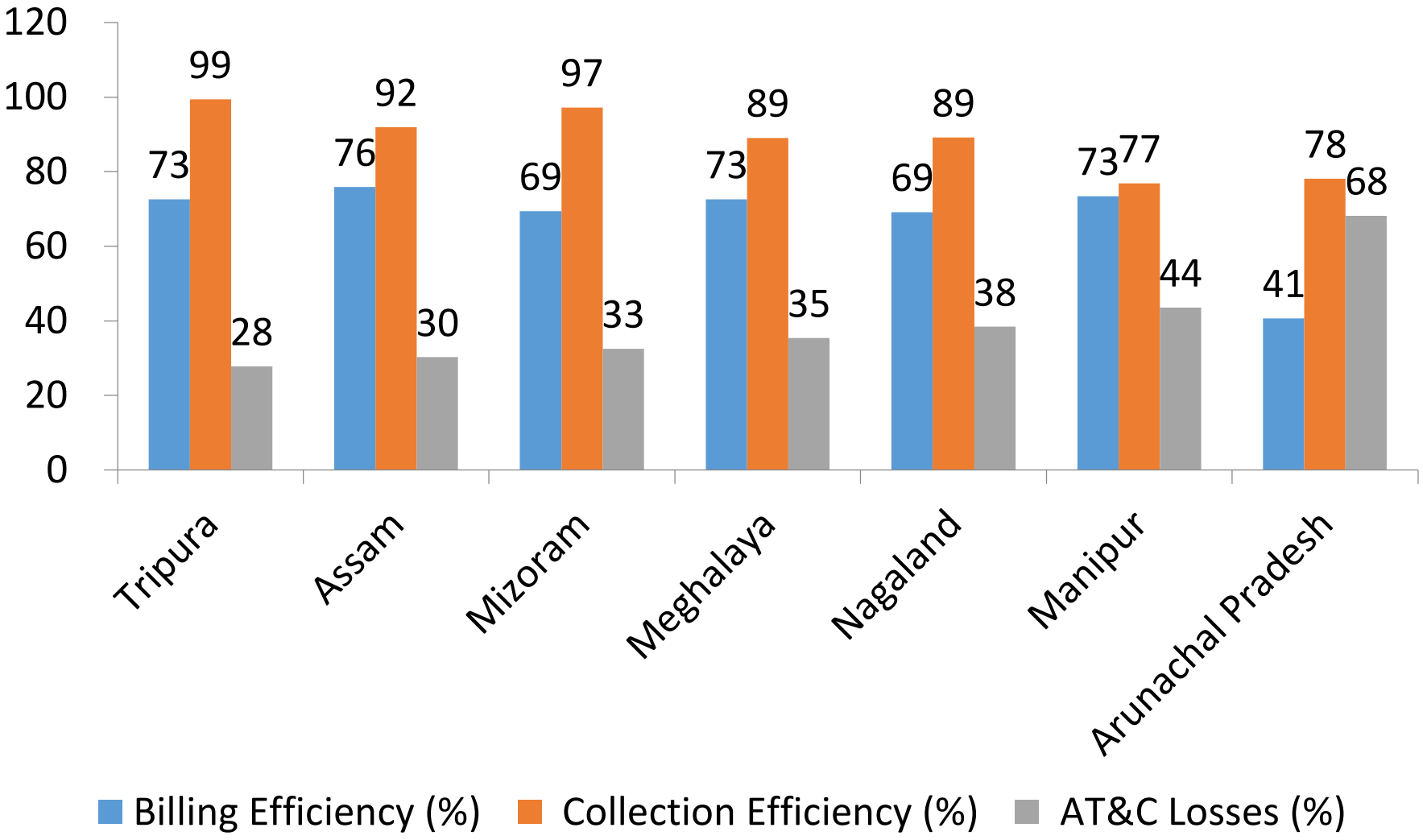
Audited Figures for 2013-14

East India



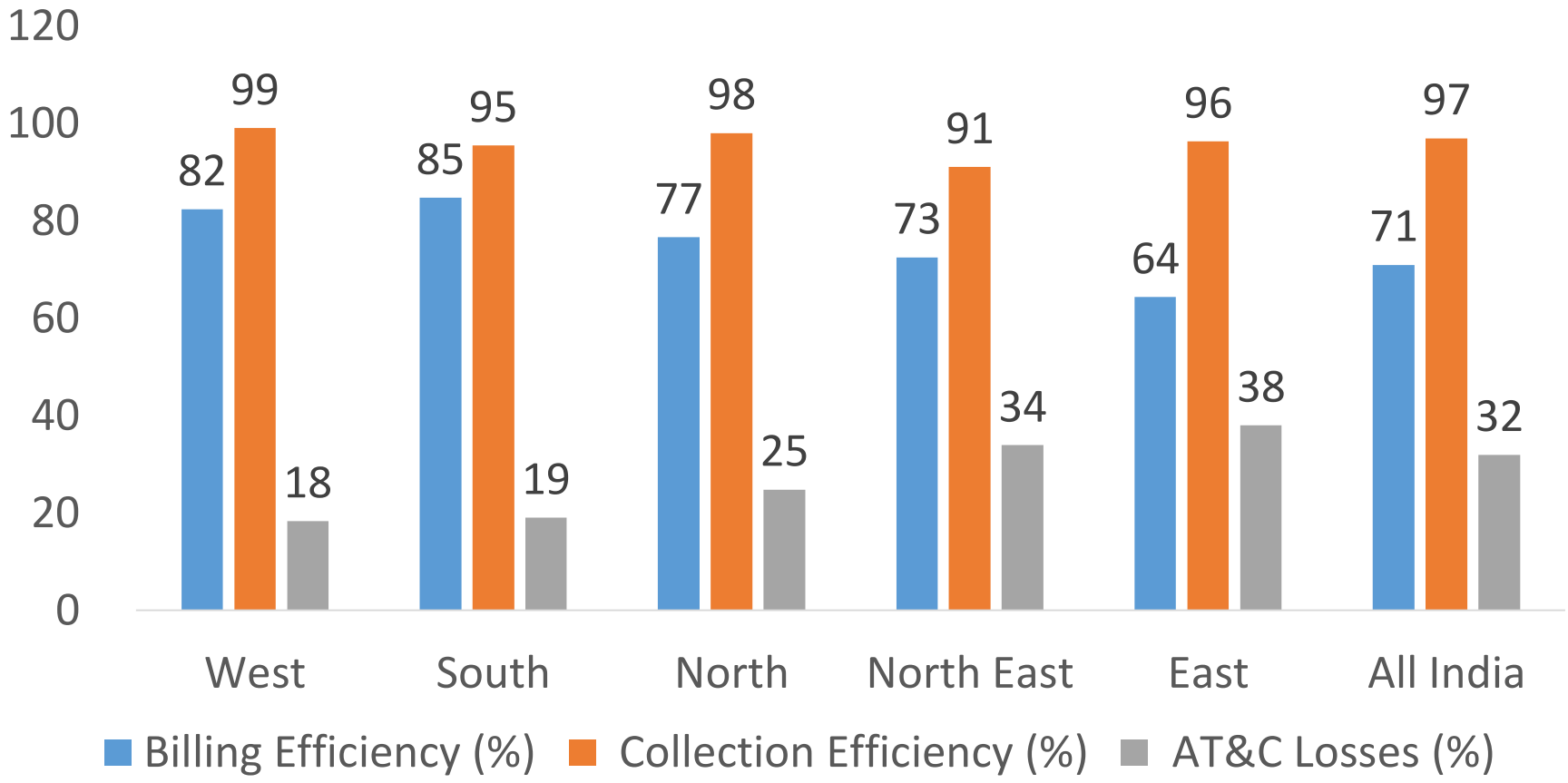
Audited Figures for 2013-14

North East India



Audited Figures for 2013-14

All India



Audited Figures for 2013-14

Potential Savings

Present

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

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

Present

Potential Savings

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

Improving billing efficiency through metering and Tracking of losses

Activity	Benefit	End Date
Compulsory feeder and Distribution Transformer (DT) metering by States	Ability to track losses at the feeder and DT level for corrective action	Feeders - 30th Jun 2016 DTs – 30th Jun 2017
Consumer Indexing & GIS Mapping of losses	Identification of loss making areas for corrective action	30th Sep 2018

Infra augmentation & Smart Metering

Activity	Benefit	End Date
2 a) Upgrade or change transformers, meters etc.	Reduce technical losses and minimize outages	31st Dec 2017
2 b) Smart metering of all consumers consuming above 200 units / month	Smart meters will be tamper proof and allow remote reading thus helping reduce theft	Consumption > 500 units / month - 31st Dec 2017 Others – 31st Dec 2019

Improving collection efficiency through public participation

Activity	Benefit	End Date
Awareness campaign against theft to ensure "honest do not pay for dishonest"	Enhance public participation to reduce power theft	One year awareness programme jointly with States up to 31st December 2016
Assure increased power supply in areas where the AT&C losses reduce	Encourage local participation to reduce losses	31st March 2018

'Mhara Gaon - Jagmag Gaon' – Haryana's Scheme to reduce loss

Details	Hours of Supply
Current	12
Identified villages with 25-70% losses	15
Install meters outside houses and replace old wires	18
After bill payment crosses the mark of 90%	21
Outstanding amount of electricity bills paid in five equal instalments	24

Demand Side Management to improve efficiency

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

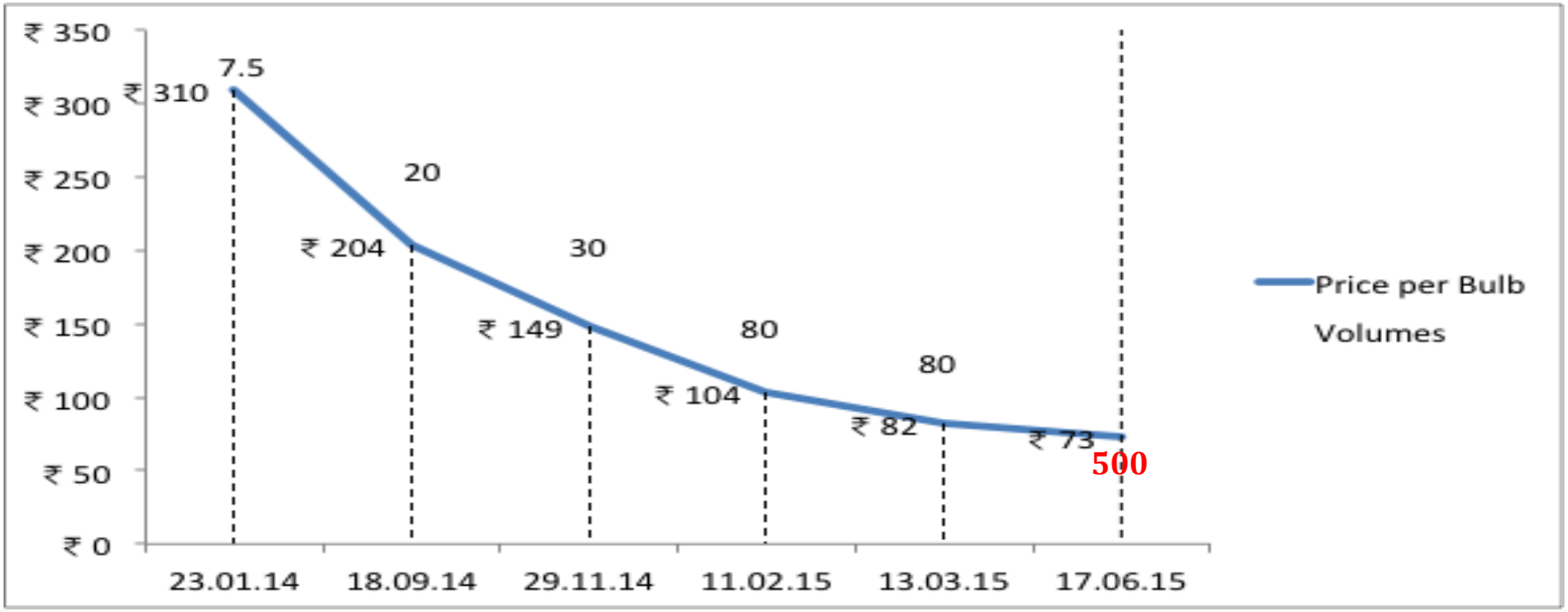
National Domestic LED Programme

Domestic Efficient Lighting Programme (DELP)	Target	Achievement
No of LED bulbs to be replaced	77 crore	2.5 crore
No of towns where work in progress/ complete	Entire country	78/7 = 85
Annual energy savings	105 b KWh	3.16 b KWh
Reduction of peak load	20,000 MW	802 MW
Annual reduction in consumer bills	Rs. 40,000 cr	Rs. 1,264 cr
Annual reduction in GHG emission	79 mn ton CO_2	5.5 mn ton of CO_2

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)

PAT Cycle	Number of Sectors	% of national energy consumption covered	Reduction in specific energy consumption
2012-15	8	30%	4%
2016-19	11	50%	5%

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

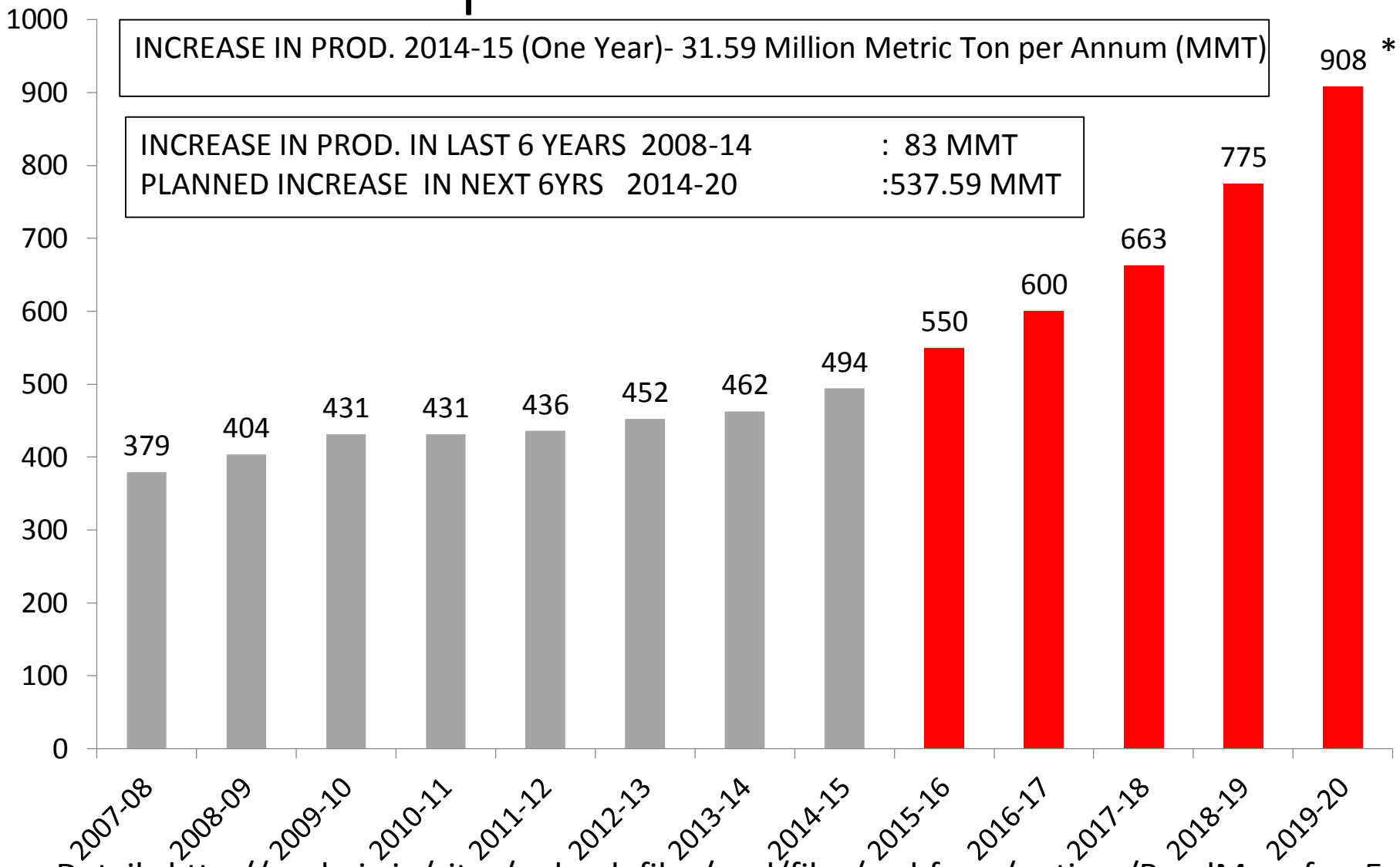
Area		Units Installed (lakh)	End Date
Feeder & DT Meters		13	2017
Smart Meters > 500 units/ mth		100	2017
200-500 units/ mth		250	2019
DT		4.2	2017
Conductors		11.2	2017
LED Bulbs	**Domestic**	7,700	2019
	Streetlights	350	
Eff. Agri Pumps		100	2019
Appliances	**Fans**	1,600	2019
	A/Cs	18	

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



Details:http://coal.nic.in/sites/upload_files/coal/files/webform/notices/RoadMap_for_Enhancement_of_Coal_Production_26052015.pdf

* 1 Bn with additional allocation of mines

Illustration of Savings - NTPC

Area	Savings (Rs. Cr.)	Per Unit Savings (Rs.)
Substituting imported coal, MoU/E-Auction coal by 100% ACQ coal	7,300	0.30
Rationalization / swapping of coal sources including freight charges	1,270	0.05
Total	**8,570**	**0.35**

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 & sub station 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

	2015-16	2016-17
Debt taken over	50%	25%

- 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

	As on 30 Sep, 2015	2015-16	2016-17	2017-18
DISCOM Debt	40,000			
Debt taken over by State		20,000	10,000	
Option A) 2yr Grant				
Grant		20,000	10,000	
Option B) 3 yr Grant				
Grant		10,000	10,000	10,000
Loan from State to DISCOM (at same rate as State borrowing)		10,000		-10,000

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

Year	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21 …
Previous Year's DISCOM loss to be taken over by State	0% of the loss of 2014-15	0% of the loss of 2015-16	5% of the loss of 2016-17	10% of the loss of 2017-18	25% of the loss of 2018-19	50% of the previous year loss

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

Area	Details	Amount (Rs. Cr.)
Interest Rate Reduction	3% on 25% DISCOM debt 4% on 75% DISCOM debt	17,000
Debt takeover by State	8% on 75% DISCOM debt	27,000
AT&C loss reduction	22% to 15%	33,000
Supply of domestic coal and coal swapping		36,000
DSM	LED, Appliances etc.	58,500
PAT		7,600
Transmission Losses	1% of Intra State	1,600
Total		1,80,700

Other Initiatives in the Distribution Sector

DeenDayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

- Electrify all 18452 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.
  - Energy Meters : 99,93,893 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

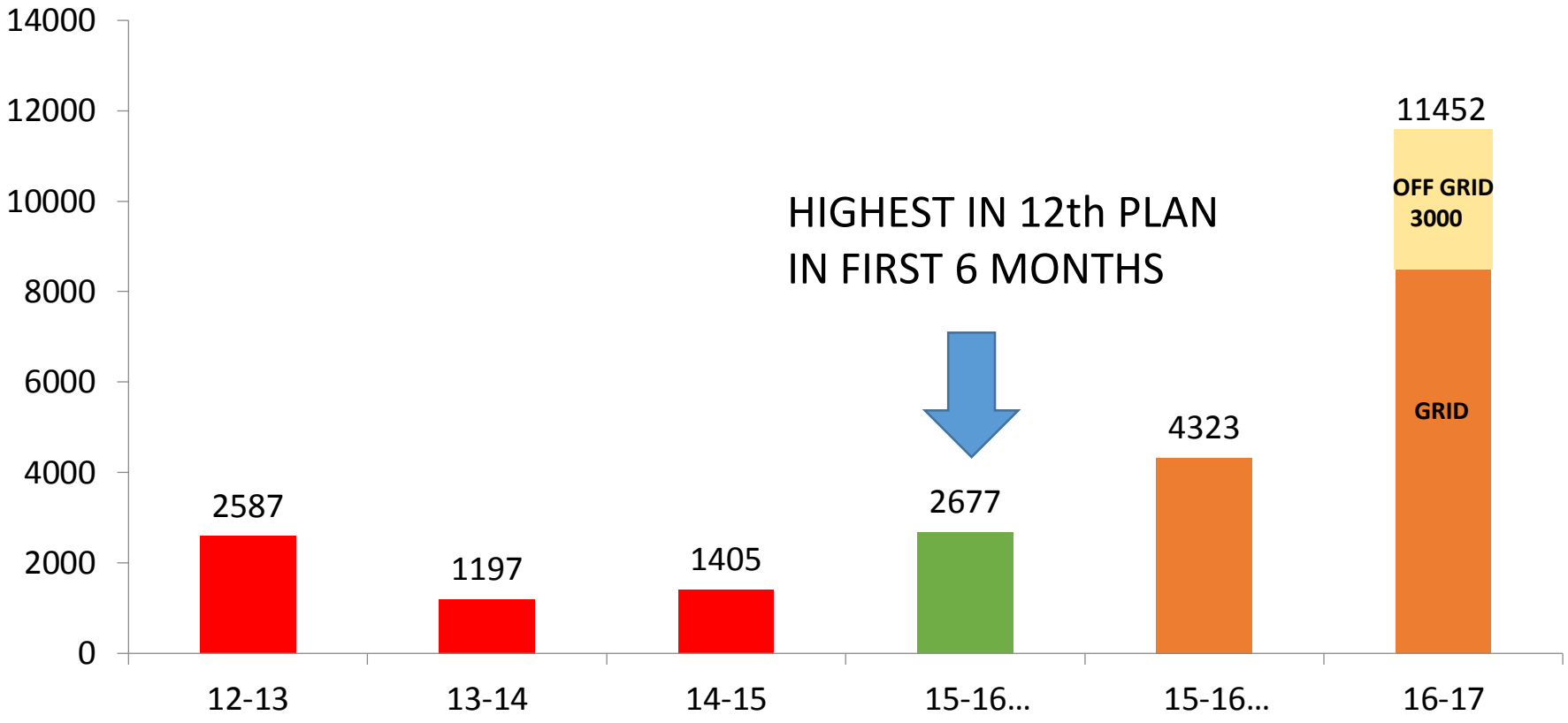
➢ Reduction in At &C looses as per the agreed trajectory

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

Impact of IT enablement

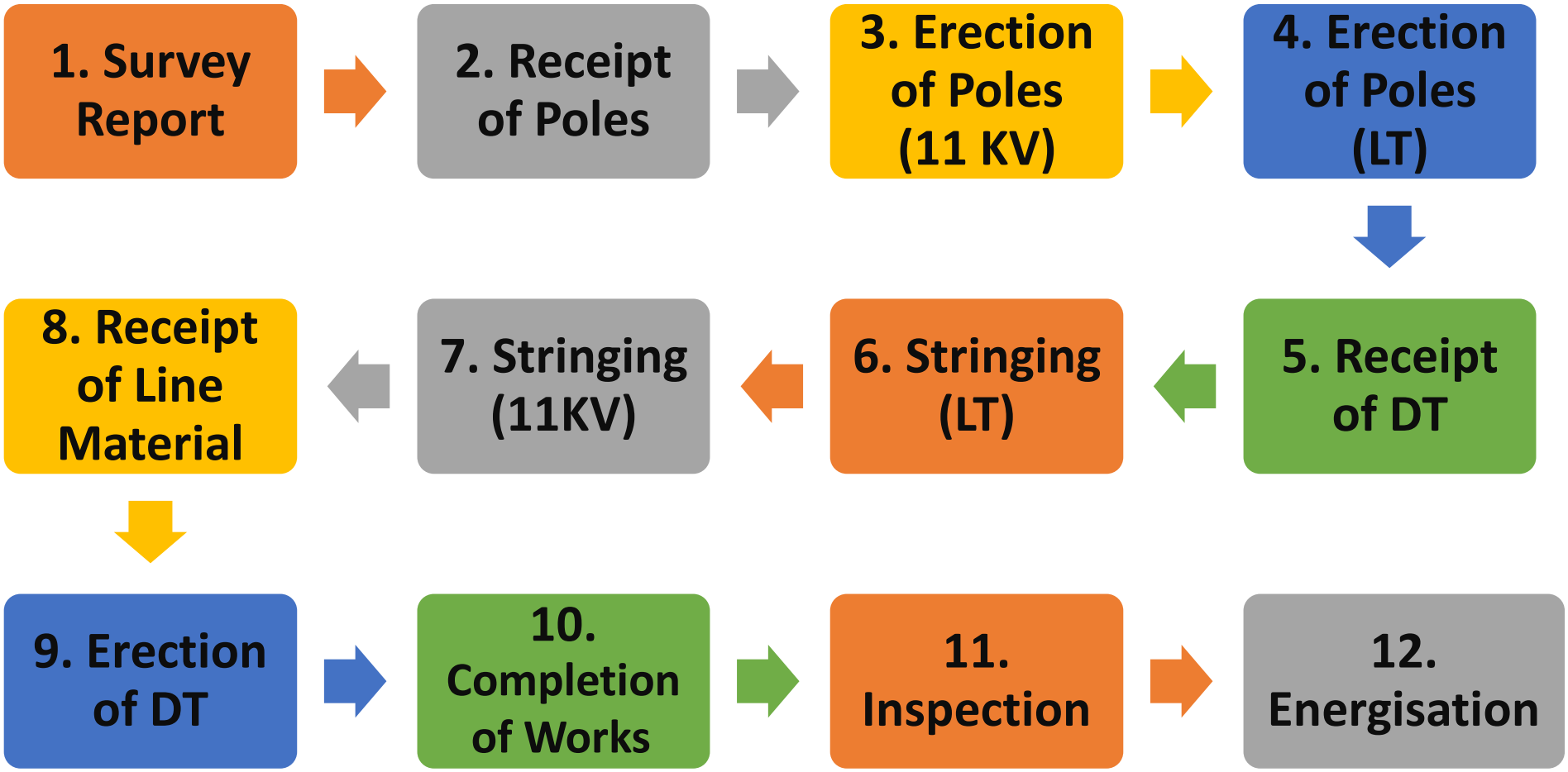
- **1st of its kind Impact Assessment of IT enablement under IPDS**
- **Estimated savings** through AT&C loss reduction could be **INR 5000 Cr**
- **1114 towns** out of **1409 towns** declared **Go-Live**
- **19** out of **21 Data Centers** Operational
- **22 SCADA Control Centers** commissioned

Villages Electrified in XII Plan

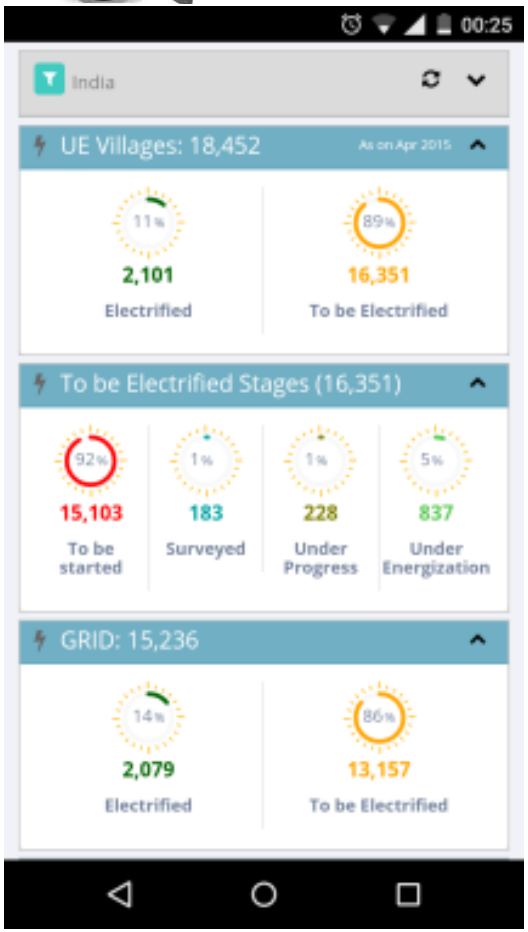


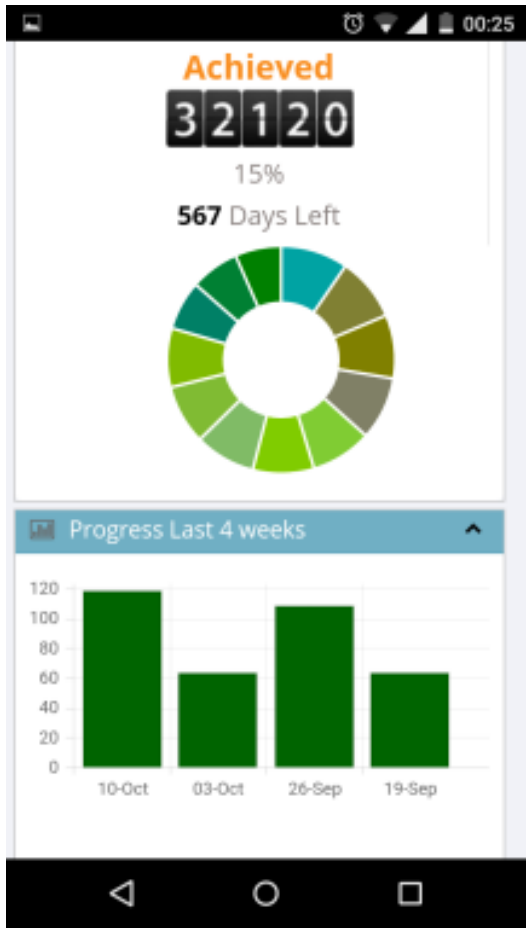
DDUGJY – Emphasis on Sustainability of DISCOMs with renewed focus on rural electrification has fastened the process from 2015 onwards. Expected to electrify all villages by 2017

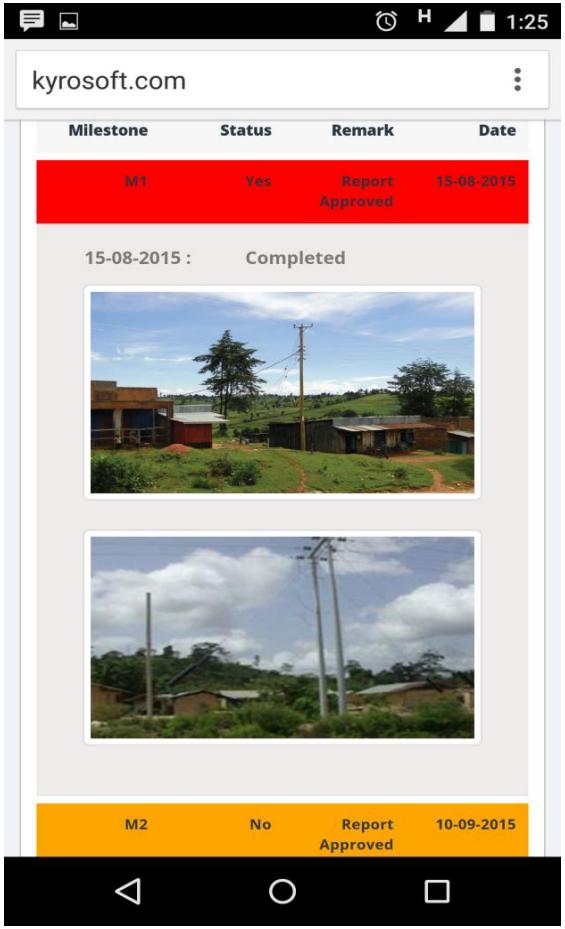
12 Stage Monitoring



Grameen Vidyutikaran App







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 Stand alone.
- 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

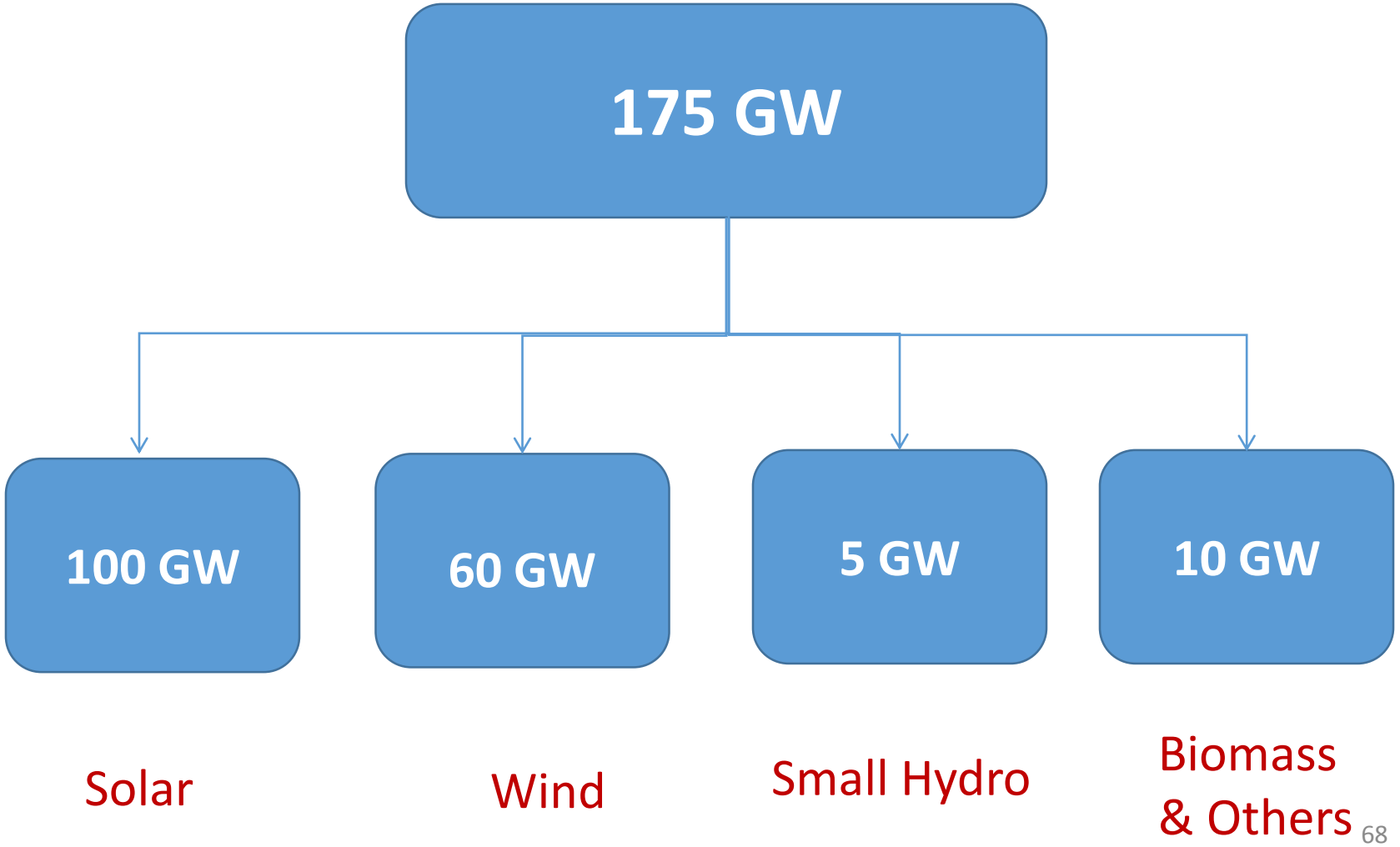
- Segregation of carriage from content
- Accelerate electricity generation from renewable energy sources
- Strengthening grid safety and security
- Rationalize tariff determination process
- Review of performance of Regulatory Commissions.
- Provide for recovery of revenue by Licensees without any revenue 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

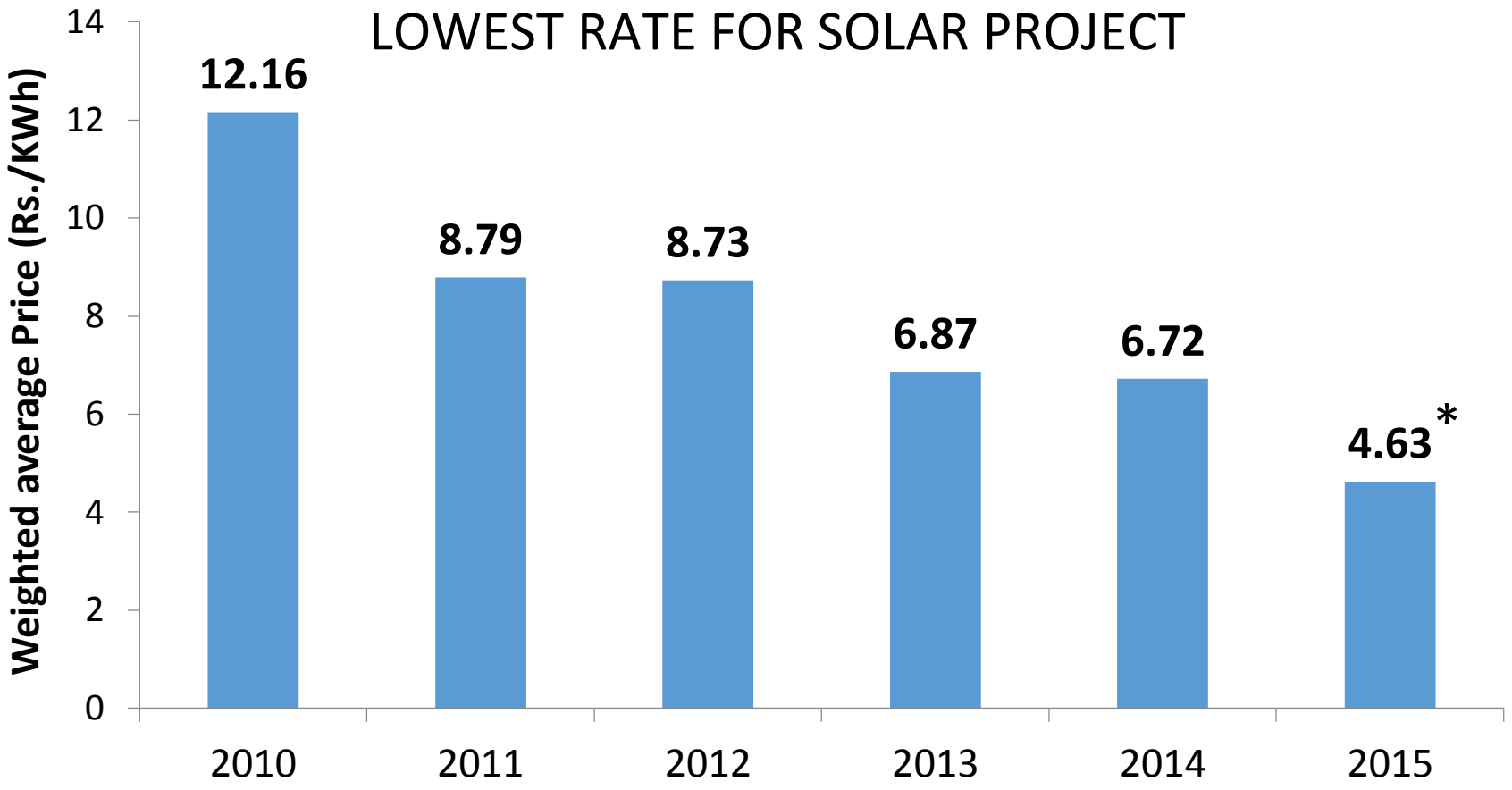
Road Map for Renewable Power by 2022



Renewable Investments by 2022

Area	Solar	Wind
Operational Capacity (GW) (approx.) (as on Oct'15)	4.4	24
Target Capacity by 2022 (GW)	100 (Ground mounted – 60 & Roof top - 40)	60
Investment Already Made (USD billion) (approx.)	5.5	22
Additional Investment to be made by 2022 (USD billion) (approx.)	80	30

Price of Solar Power reduction to achieve Grid Parity



* 500 MW bought by NTPC through Reverse e bidding on 4th Nov at midnight

Total Investment Potential (by 2022)

Area	Potential (USD Bn)
Renewables	120
Generation (CPSUs, States, UMPPs & Private Sectors)	50
Transmission	50
Sub Transmission & Distribution	25
Energy Efficiency	5
Total	**250**

Sabka Saath, Sabka Vikas

Thank You

सबका साथ
सबका विकास

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