

The Price of Plenty

Insights from Surplus Power in Indian States

*Reflections on Contemporary Issues in the Electricity
Sector*

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www.prayaspune.org/peg

Objective and Scope

- What is the nature and extent of surplus, backing down in various states?
- How did DISCOMs end up with surplus?
- What are the various ways DISCOMs, ERCs and State Governments are managing surplus?

Existence of surplus power \neq Adequate Access for All.

- *Access requires concerted efforts and support and is not the focus on this report*

Approach

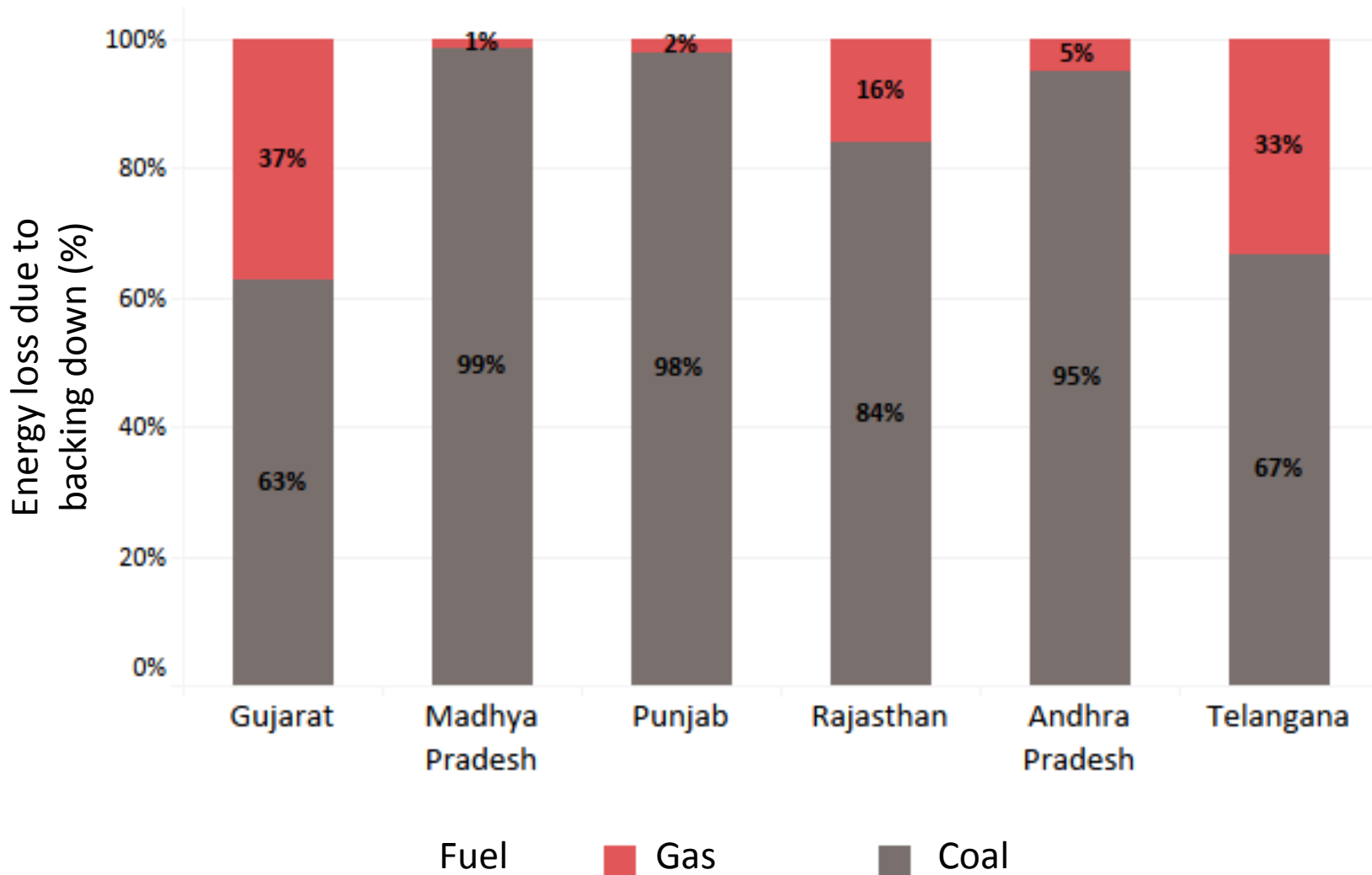
- Identify trends, challenges and lessons from the experiences in states
- Based on study of publicly available information
 - Regulatory submissions and orders, state and central government documents, available data from various load dispatch centres, APTEL judgements
- Constraints in Analysis
 - Lack of consistent and adequate information in the public domain on the issue
 - Some examples include- scheduling practices, capacity in the pipeline, projections of backing down, wide variation in terminology (economic shutdown, boxing up etc.)
 - Does not affect the larger observations and conclusions drawn from insights.

Extent and Impact of Backing Down in States

State owned DISCOMs in:	% of contracted capacity	% of total power purchase fixed cost
Maharashtra	19%	21%
Punjab	27%	33%
Rajasthan	14%	16%
Madhya Pradesh	17%	28%
Gujarat	30%	36%

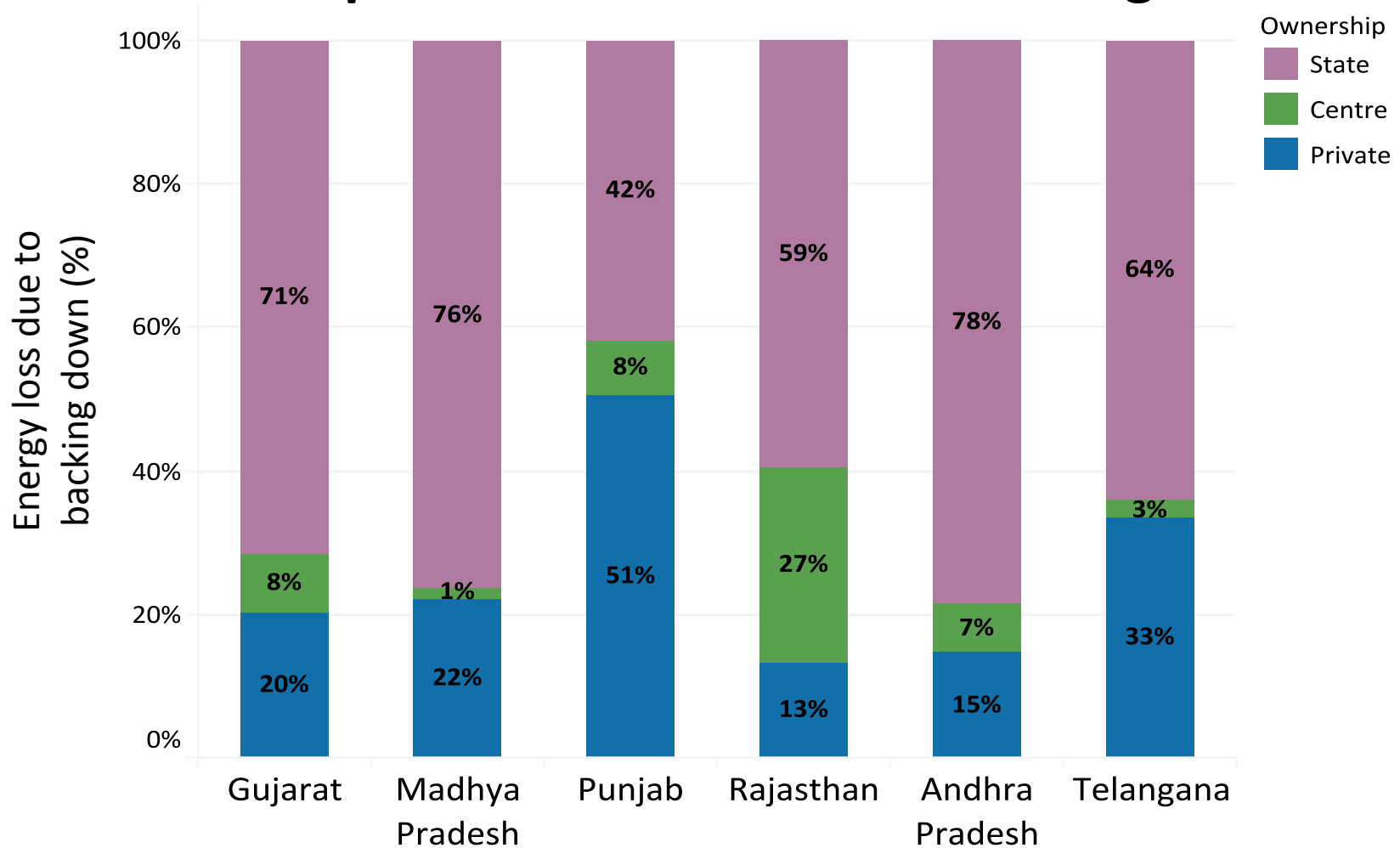
- 15% to 30% of installed capacity backed down in states
- States have been experiencing sustained surplus for 4-5 years.
- Significant fixed cost impacts –about 15% to 35% of total fixed cost payable to generators

Fuel-wise Contribution to Backing Down



- Coal based capacity forms large part of capacity backed down
- True even in states with significant gas based capacity
- Data for 2015-16 and 2016-17 (Section 2 of Price of Plenty- PEG report)

Ownership-wise Contribution to Backing Down



- State-owned generating capacity forms large part of capacity backed down (except in Punjab)
- Share of private generating capacity being backed down is also significant
- Data for 2015-16 and 2016-17 (Section 2 of Price of Plenty- PEG report)

Other Key Trends

- Surplus power is seasonal
 - Punjab, Haryana and Rajasthan have instances of sustained surplus with seasonal shortages
 - Punjab: 2200 MW surplus in winter and 1600 deficit in winter
 - Haryana: 6000 MW variation between summer and winter peak
- Many plants are partially backed down but some are shut down for prolonged periods of time
 - Examples include Goindwal Sahib TPS (540 MW) , contracted by PSPCL, and GSECL's Ukai TPS (850 MW)
- Variable cost of backed down coal-based capacity in the range of ₹ 2.7/kWh to ₹ 3.3/kWh.
 - Whereas, total tariff for newly contracted capacity in shortage states in the range of ₹ 4/kWh to ₹ 5.7/kWh.

Examples of Recently Commissioned Capacity Being Backed Down

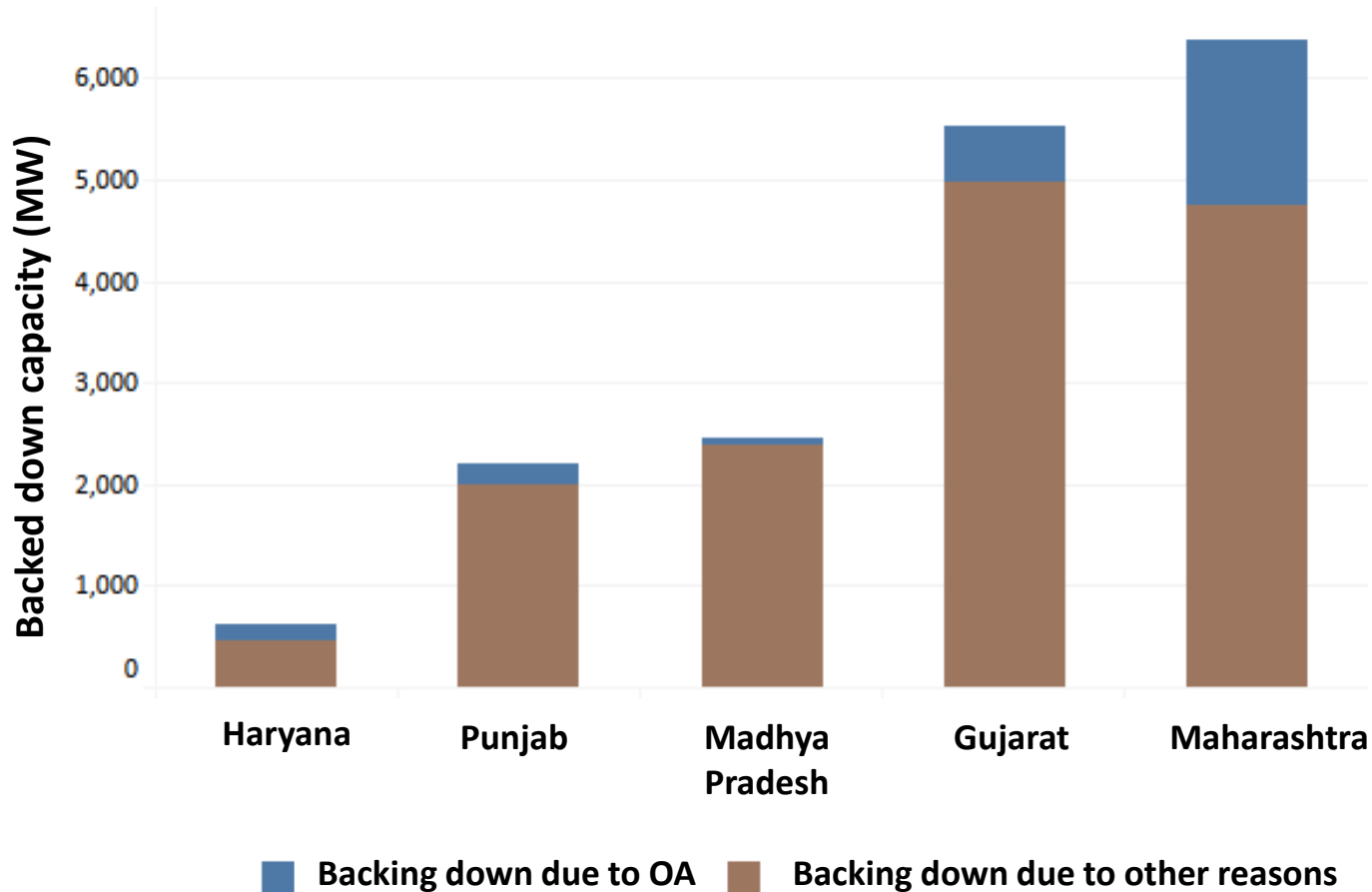
Ownership	DISCOMs in:	Station	Contracted capacity (MW)
Private	Punjab	Talwandi Sabo TPS	1,980
		Goindwal Sahib TPS	540
		NPL Rajpura TPS	1,400
	Maharashtra	Rattan India (Amravati)	904
	Madhya Pradesh	Jhabua Power (Seoni)	210
		Jaypee (Bina)	350
	Maharashtra	Bhusawal Unit 4 & 5	1,000
State	Rajasthan	Ramgarh TPS (Stage 3)	160
		Chhabra TPS (Unit 5)	660
	Madhya Pradesh	Singhaji TPP	1,200
Central	Gujarat	Wanakbori 8 [#]	800
		Mouda Stage 2 Unit 2 [#]	147
	Maharashtra	NTPC Solapur [#]	202

[#] These plants have not been commissioned as yet but are projected to be backed down.

How did DISCOMs end up with surplus power?

Sales Migration Due to Open Access

- Open Access is not the major cause of backing down in most states



- Short-term open access makes power procurement planning challenging
 - Usually for weekly, daily durations
 - Opportunistic switching by consumers between market and DISCOMs based on prices
 - Most open access across states is short-term

Demand Estimation and Power Procurement Planning

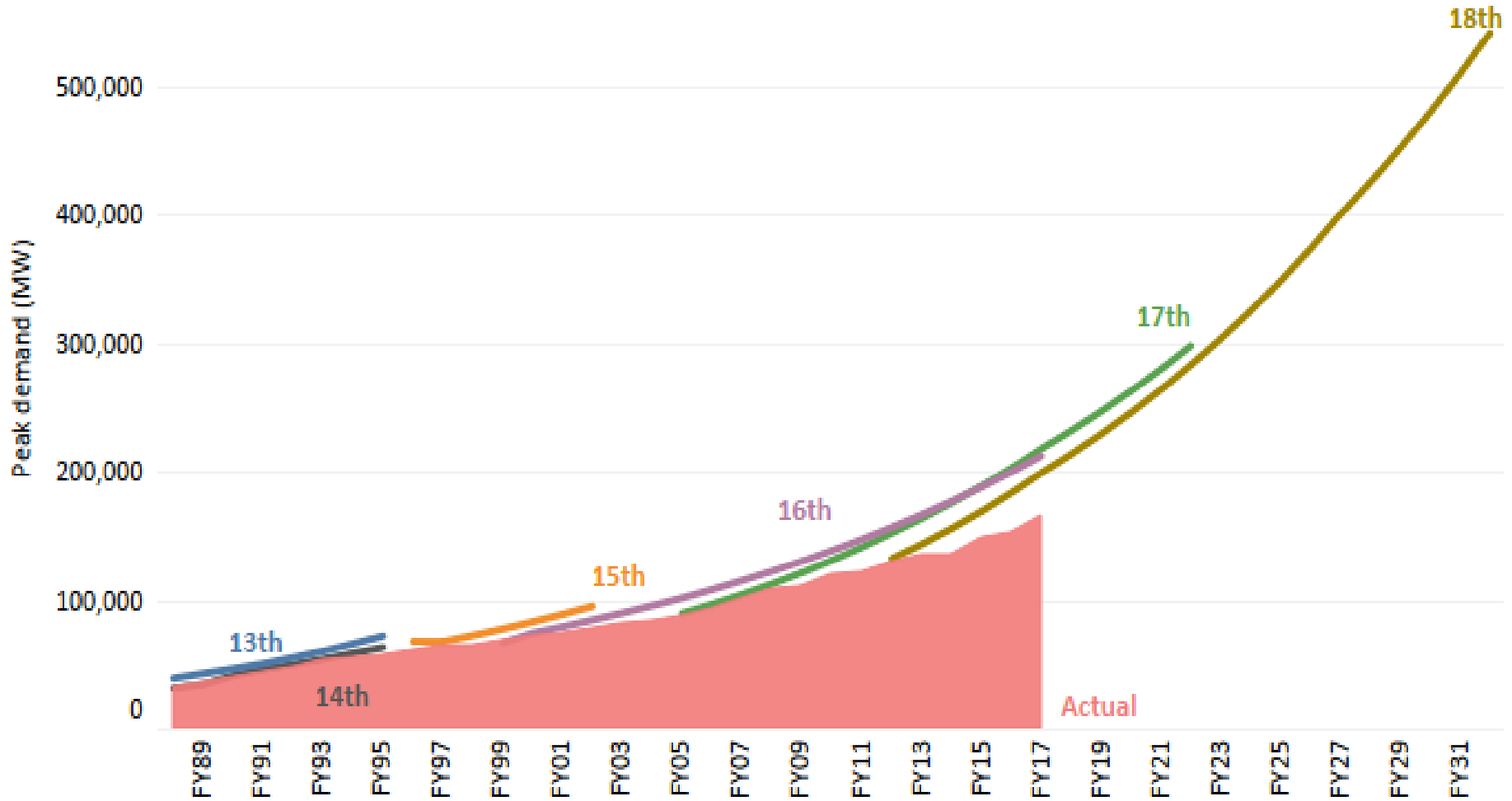
- All states have regulations which specify
 - Demand forecasts on an annual basis for 5 to 10 year periods
 - Power procurement assessment based on forecasts
- Regulations also specify considerations for assessment
 - Captive, open access sales, impact of energy efficiency and demand side management measures, variations due to agricultural consumption, seasonal daily variations in demand, impact of government policies
 - Assessment of energy availability based on retirement of assets, capacity addition in the pipeline
 - MPERC regulations also issue penalties and initiate suo-motu proceedings in case of non-compliance.

In Practice..

- Even though regulations specify extensive demand projection and capacity addition planning process. Most states either:
 - Simply rely on CEA EPS Demand forecasts.
 - Deviate from CEA forecasts , mostly on the higher side.

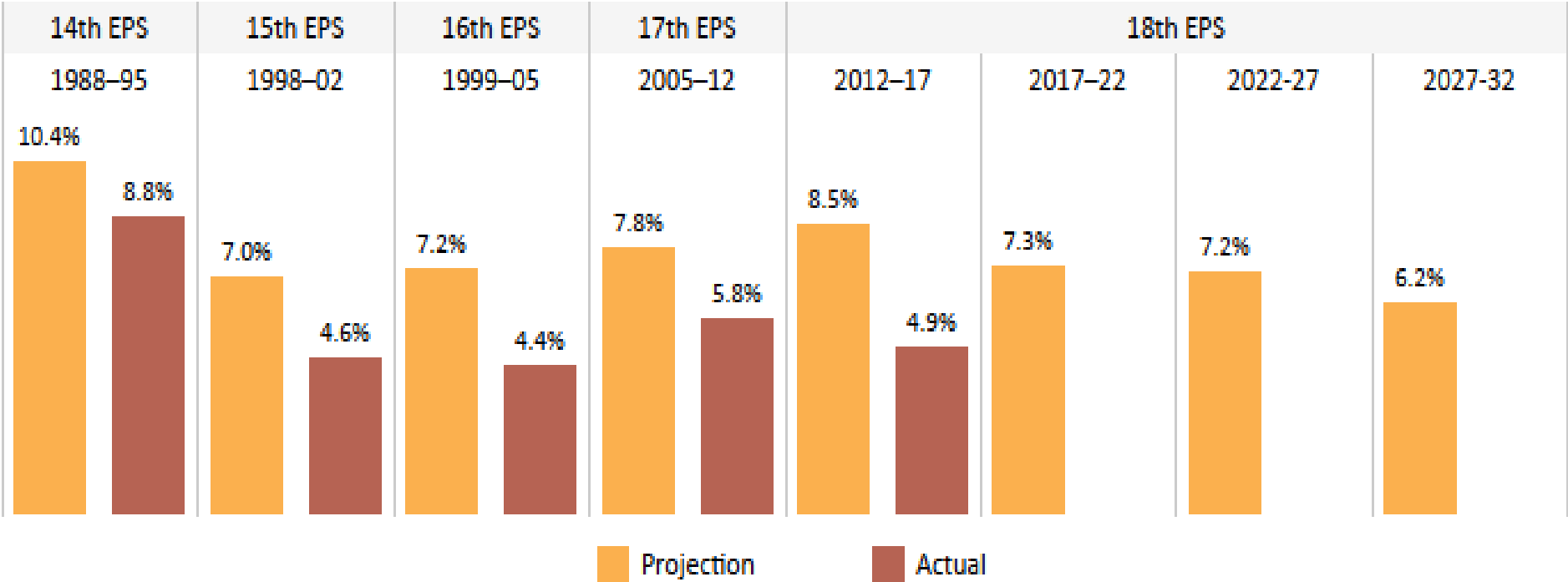
CEA Estimates- Long History of Significant Overestimation of Demand..1

CEA (EPS) demand estimations: Projected vs. Actual



CEA Estimates- Long History of Significant Overestimation of Demand..2

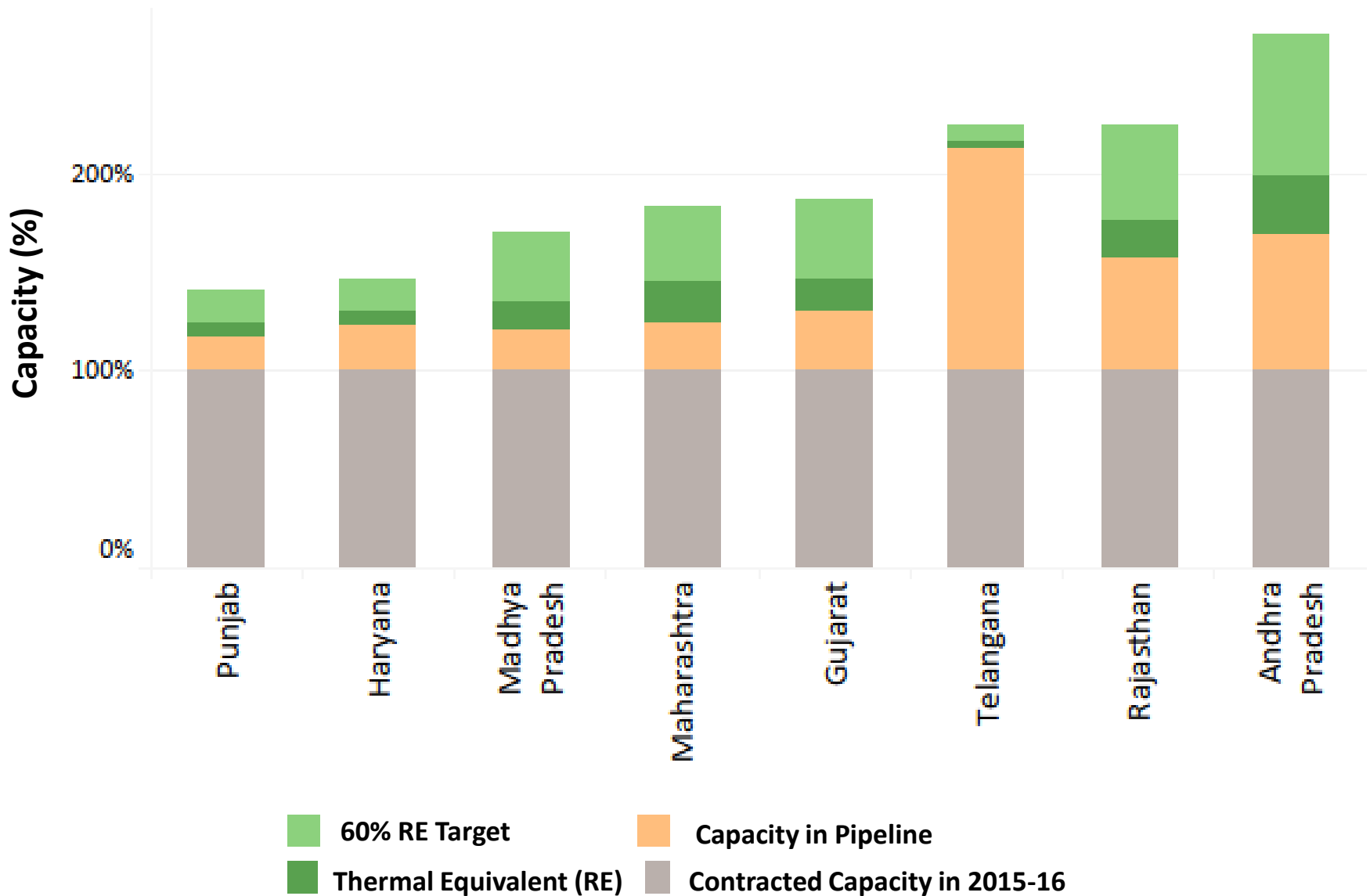
CEA (EPS) demand growth percentage: Projected vs. Actual



Reasons for Deviations by States

- To meet the objective of 24*7 power for all
 - Increased hours of supply to rural areas and agricultural consumers
 - Elimination of shortages and meeting reserve requirement
 - No monitoring of supply hours despite heavy investment
- Anticipation of high growth in demand
 - In domestic consumption
 - Increased commercial and industrial demand
 - Due to upcoming infrastructure projects in other sectors
 - Due to expected increase in economic growth
 - Due to impact of government programmes (e.g- lift irrigation scheme, programmes such as 'Make in India')
- Issues with capacity in the pipeline
 - Possibility of slippage or non-materialisation of plants considered
 - Management of retirement of units
- Procurement of RTC power when seasonal/peak power was required
 - Lack of interest from generators

Capacity in the Pipeline and its Implications



How are DISCOMs managing surplus capacity?

Sale of Power..1

- Over-projections for revenue from sales
 - ERCs project high availability of power , rate of sale
 - Reduce power purchase expenses by projected revenue from sale
 - Thus the projected revenue gap is reduced by that amount
- Implications of over-projection of revenue from surplus sale
 - Revenue gap is met via increase in tariffs or it is added to accumulating losses
 - This helps potentially reduce projected requirement for increase in tariffs/losses for that year
- Are DISCOMs able to recover revenue?
 - Revenue recovery from sale of surplus is lower than projected
 - Lower availability than expected, lower rates realised via short-term markets
 - Is adjusted based on actual revenue from sale of surplus during true-ups
 - Cost of surplus power is passed on to consumers
- Implications
 - Undermines objective of eliminating revenue gaps
 - Postpones recovery of tariffs, increases future losses
 - Reduces legitimacy of regulatory decisions

Sale of power..2

State	Year	Revenue projected by ERCs from sale of power (Rs. Cr)	% of projected revenue gap met by assumed sale of power
Rajasthan	2015-16	2804	45%
Haryana	2013-14	4019	47%
Delhi	2014-15	5816	29%
Punjab	2014-15	820	58%
Madhya Pradesh	2014-15	7804	100%
Andhra Pradesh	2016-17	4493	46%

- Data on actual revenue from sale of power is not reported as yet
- States where true-ups have been completed show 80% to 50% less revenue recovery from sale of power
- Other approaches for sale of surplus
 - Gujarat does not approve sale of power but adjusts any sale in true-ups
 - Maharashtra ERC → Actual sale of surplus > projections
 - Some states are moving away from this approach (Punjab)
 - Haryana disallows recovery of losses due to non-realisation of revenue from consumers
 - Delhi disallows revenue earned from UI /DSM sales

Other Measures

- Levy of additional surcharge

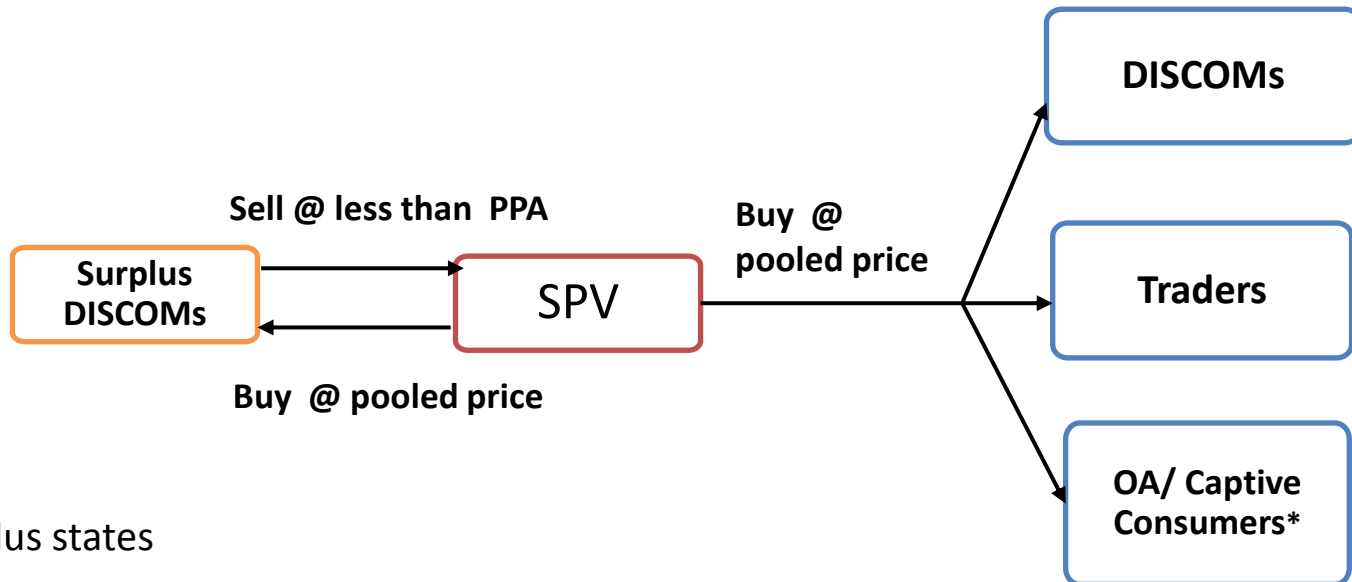
State	Maharashtra	Gujarat	Rajasthan	Punjab	Haryana
Additional surcharge (Rs./ kWh)	1.11	0.44	0.8	1.13	0.87

- Banking arrangement , especially in the Northern Grid
- Surrender of capacity
 - Surrender and reallocation of NTPC capacity on a regular basis but quantum is small
 - Many states are trying to surrender central sector and as well private contracted capacity but are facing legal hurdles
 - Early decommissioning of frequently backed down state generating capacity
- Review / deferment of capacity addition
 - MERC directions to review PPAs and defer addition in specific cases
 - Punjab and Haryana exploring options to review PPAs

Suggestions for Way Forward

Effective Utilization of Existing Capacity..1

- Reallocation of Power
 - Union Government to create SPV which bundles surplus power for re-allocation
 - All power to be surrendered to be identified by states and sold to SPV at less than regulated tariff/PPA rates (say, 50p reduction of per unit fixed cost)
 - SPV to arrive at pooled price based on surrendered capacity for sale of power
 - Power to be sold via weekly, seasonal, medium-term RTC/peak/off-peak contracts to all
 - States surrendering power cannot buy additional power from any other source other than SPV
 - Reallocation can be provided at concessional rates to access deficit states.



* In non-surplus states

Effective Utilization of Existing Capacity..2

- Conditional, low-cost, procurement options to access deficit states:
 - States with access imperative have low ability to pay and low creditworthiness
 - unable to negotiate favourable rates for power procurement.
 - Reducing cost of surplus power for access deficit states
 - Surplus states can forego part of fixed cost
 - Central Government foregoes clean environment cess from re-allocated capacity
 - Financial support from central and state governments to support re-allocation
 - Concessions conditional to DISCOMs ensuring uninterrupted supply on monitored (AMR) feeders
- Encourage long term open access rather than short term OA
 - Amending regulations to restrict duration of OA to > 1 year
 - Increasing the levy of additional surcharge for short-term open access consumers
 - Providing tariff rebates to industrial consumers who exceed previous years consumption
- Development, deepening of market instruments for seasonal, medium term trade
 - Possibility of month ahead contracts in PXs
 - Use of DEEP by DISCOMs as well as OA, captive consumers

Prevent Build-up of Further 'surplus'

- Robust demand forecast and capacity planning exercises on a regular basis
 - Separate medium, long-term demand forecasts for base, intermediate, peak load taking into account sales migration, historic trends, impact of EE, tariff elasticity, grid integration of RE etc.
 - Firm and timely exit from significantly delayed projects based on informed call
 - Mix of short, medium, long term contracts and banking arrangements to meet requirements
- Modification/ creation of regulations to reflect the same
 - Adherence to regulations to be included in DISCOM rating exercises
- Strengthen planning capacity
 - Increase strength and capacity of power procurement wings
 - Use of planning and dispatch tools in planning to reduce uncertainty

Public Process for Power Procurement Planning

- Power procurement → 75% of costs and concerns all consumers
- Need for public review of power procurement planning which includes
 - Robust demand estimation and assessment of pipeline capacity
 - Needs to be conducted every 2 years
- Process to be akin to tariff process
 - Publicly available petitions, consultations via public hearings, reasoned orders
 - SERCs to initiate suo-motu proceedings in case of delay
- Regulations to be amended to ensure such consultative process.
- **New PPAs only after such an extensive review is completed**

Surplus Need Attention Before it Becomes a Chronic Issue

- Crucial issues which have not been solved for over 2 decades
 - Excessive transmission and distribution losses
 - Excessive cross subsidy in tariffs
- Growing surplus will become as chronic and will be difficult to solve for years to come
- Issue will be more difficult to address
 - Huge investments, lock-in of scarce resources, long term legal contracts
- Therefore sustained surplus needs to be avoided rather than managed.

Thank You

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