

Minutes of Special Meeting on Implementation of SAMAST Scheme in Haryana and Punjab

Venue : Upper Ground Floor, Conference Hall,
CERC

Date : 22-12-2017

List of Participants : At **Annexure – 1 (Enclosed)**

1. A Special meeting of Technical Committee for Implementation of SAMAST Scheme in Haryana and Punjab was held under the Chairmanship of Shri A S Bakshi, Member, CERC on 22nd December 2017. Shri Bakshi welcomed all the participants. At the 15th Technical Committee meeting it was decided that separate meeting shall be organized to handle the issues of SAMAST implementation in the States of Haryana and Punjab. Shri. Bakshi highlighted that the Committee is working on various important aspects related to grid management & security with integration of large amount of renewable energy (RE) and underscored that it is essential for both the States (Haryana and Punjab) to implement Availability Based Tariff (ABT) framework at the earliest.
2. Dr. S.K. Chatterjee, Jt Chief (RA), CERC, welcomed all participants on behalf of the FOR Secretariat and welcomed Members of State Commissions and utilities. He explained that before implementation of two-part tariff structure within ABT framework, payment to generators was based only on actual injection, which resulted in perverse tendency for the generators to over-inject irrespective of grid frequency with little regard for grid reliability. With fixed cost recovery assured in a two-part tariff structure, and subsequent alignment with Deviation Settlement Mechanism (DSM), generator behavior that helps grid security and reliability has been encouraged. Energy accounting w.r.t. schedule and actual, calculation and settlement of deviation as well as implementation of other recommendations contained in SAMAST report are pre-requisites for this.
3. Further, Dr. Chatterjee underscored that the presentation prepared by consultant covers the experiences of different States which have implemented ABT in terms of commercial settlement and technical aspects. The presentation also covered comparison of Deviation account, both in terms of MUs and Charges, in pre and post ABT era.
4. The consultant (Idam Infra) made a presentation on the following issues:-
 - a) **Need and approach for ABT implementation at State level**
 - b) **Haryana : Status Update**
 - c) **Punjab: Status Update**

Need and approach for ABT implementation at State level

Discussion:-

1. The consultant explained the background, mechanism, objectives and benefits of ABT system. The experiences of Maharashtra and Madhya Pradesh in implementation of ABT system with the help of pre ABT and post ABT deviation settlement graphs (quantum and amount) was discussed. Graph representing deviation volume and deviation amount for MP and weekly average capacity drawal, average deviation MW, weekly deviation Units and Charges for Maharashtra were shared in the presentation.
2. The graphs highlighted substantial reduction in Deviation in terms of both Volume and charges post implementation of ABT in both the States (MP & Maharashtra). Further, it was underscored that the benefits of implementing ABT are far reaching and is must with high amount of RE proposed to be integrated in the grid in coming few years.
3. The benefits of having intra-state ABT, like, improvement in regional UI (payable/receivables) management, identification of deviation causer, causer pays principle etc were discussed at length. The Consultant highlighted that the implementation cost of ABT will not have significant impact on cost of power in the State as a whole. The consultant also highlighted that the new system (balancing & settlement) will promote the development of market, i.e., encourage participation by multiple buyers and sellers. Quality of supply and the efficiency of various entities/institutions will also improve and will not be favorable to any Participant.
4. Representative from HVPN highlighted that Haryana is paying around INR 1-1.5 crores on weekly basis as UI charges to regional pool. It was also highlighted that actual drawal in Haryana is high compared to scheduled drawal.
5. It was conveyed that partial funding from PSDF is available for implementation of SAMAST which covers the cost of Hardware Components, Software Components, Communication Components, Training & Capacity building and Infrastructure Development, Further, Shri Bakshi informed that as per suggestion of Technical Committee, an advisory has been sent to NLDC to include the cost of interface metering under the funding from PSDF.

Haryana: Status Update

1. Major cost components of DPR for SAMAST implementation in Haryana were discussed in detail. Draft scheduling & despatch code for Haryana, draft F&S Regulation and draft DSM Regulation for Haryana were presented. In the draft F&S regulations, due to less solar installation in Haryana, the minimum capacity is suggested as 1 MW instead of 5 MW as per FOR Model F&S Regulations.

2. Shri M S Puri, Member, HERC, informed that Draft F&S Regulations would be published soon for stakeholders' comments.

Action Points:-

1. DPR finalization and approval from HVPN Management is required.
2. Regulatory process to be initiated for F&S and DSM Regulations.

Punjab : Status Update

1. It was highlighted that the challenge in Punjab for implementation of intra-state ABT is unavailability of segregated annual accounts of Generation & Distribution. Further, the latest tariff order of PSPCL was summarized to highlight the segregation of cost components between Generation & Distribution. Allocation of fixed cost for generation function should be undertaken for each station separately.
2. TNERC Chairperson suggested that to begin with, PSERC can segregate cost components of generating station considering capacity and vintage, until accounting separation is put in place.

Action points:-

1. It was agreed that the Consultant shall visit PSERC to meet officials of Punjab SLDC to discuss any issues related to implementation of SAMAST framework in Punjab.

Decision:-

1. It was agreed that next meeting on the said topic would be organized in Chandigarh and the management of utilities would also be invited to address any issues in implementation of SAMAST framework in respective states.

With this, the meeting was concluded and Shri Bakshi thanked all the participants for fruitful discussions.

Annexure-1**LIST OF PARTICIPANTS AT THE SPECIALMEETING ON IMPLEMENTATION OF SAMAST SCHEME IN HARYANA AND PUNJAB HELD ON 22.12.2017 AT FORUM OF REGULATOR, NEW DELHI**

1	Shri. A. S. Bakshi, Member	CERC
2	Dr. M.K Iyer, Member	CERC
3	Shri S Akshay Kumar, Chairperson	TNERC
4	ShriJagjeet Singh, Chairperson	HERC
5	Shri M. S. Puri, Member	HERC
6	Ms.Anjuli Chandra, Member	PSERC
7	Shri G S Kohli, Director	PSERC
8	Shri S. C. Saxena, DGM	POSOCO
9	Shri S. K. Chatterjee, JC (RA)	CERC
10	Ms. Shilpa Agarwal, JC (Engg.)	CERC
11	Ms. Shruti Deorah, Advisor – RE	CERC
12	Shri Jai Ram, XEN	HVPN
13	Shri Siddhartha Arora, RO	CERC
14	ShriVarunAnand, AC (Engg.)	CERC
15	ShriAjitPandit, Director, Idam Infra	Consultant
16	ShriAbhishek Dixit, Consultant, Idam Infra	Consultant



Idam Infrastructure Advisory Pvt. Ltd.

Status of Implementation of SAMAST Report/Forecasting And Scheduling & DSM Regulations (Haryana and Punjab)

For Discussions Special Meeting of FOR Technical Committee

December 22, 2017

The engagement of Consultant for support to FOR and its Technical Committee is supported under USAID/GTG-RISE initiative through Deloitte.

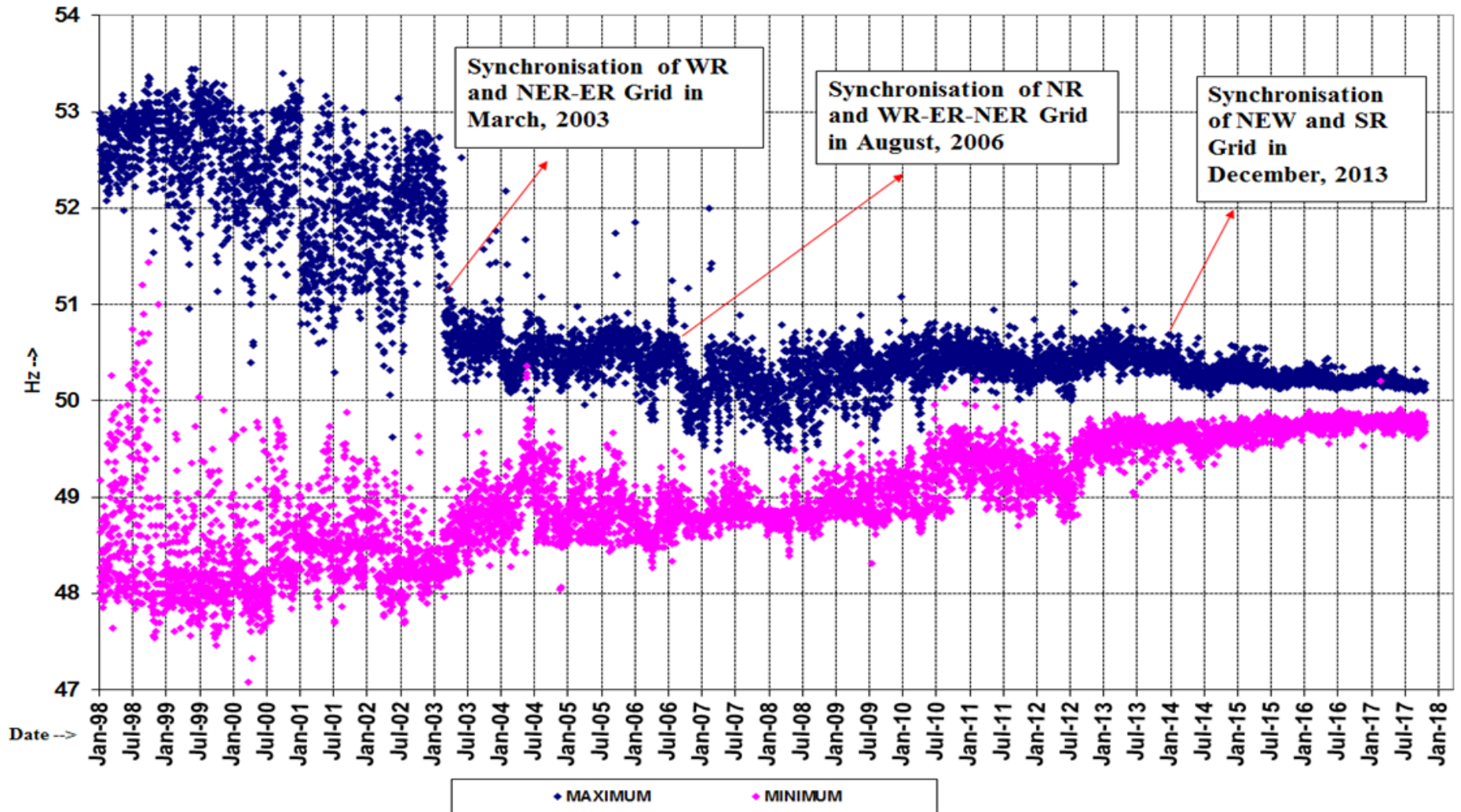
- **Need and approach for ABT implementation at State level**
 - Technical and Commercial Considerations
 - Experience of other states (viz. Madhya Pradesh, Maharashtra)
- **Haryana : Status Update**
 - Overview of State Profile, State Entities, Interface Points, Metering, regulatory framework
 - DPR preparation and Budgetary Cost Estimate for SAMAST
 - Draft F&S Regulations for Haryana
 - Draft DSM Regulations for Haryana
 - Next Steps for Haryana (*for discussion*)
- **Punjab: Status Update**
 - Overview of State Profile, State Entities, Interface Points, Metering, regulatory framework
 - Steps towards ABT implementation (pre-requisites)
 - Functional Segregation
 - Draft F&S Regulations for Punjab
 - Next Steps for Punjab (*for discussion*)

ABT framework at regional level : historical developments



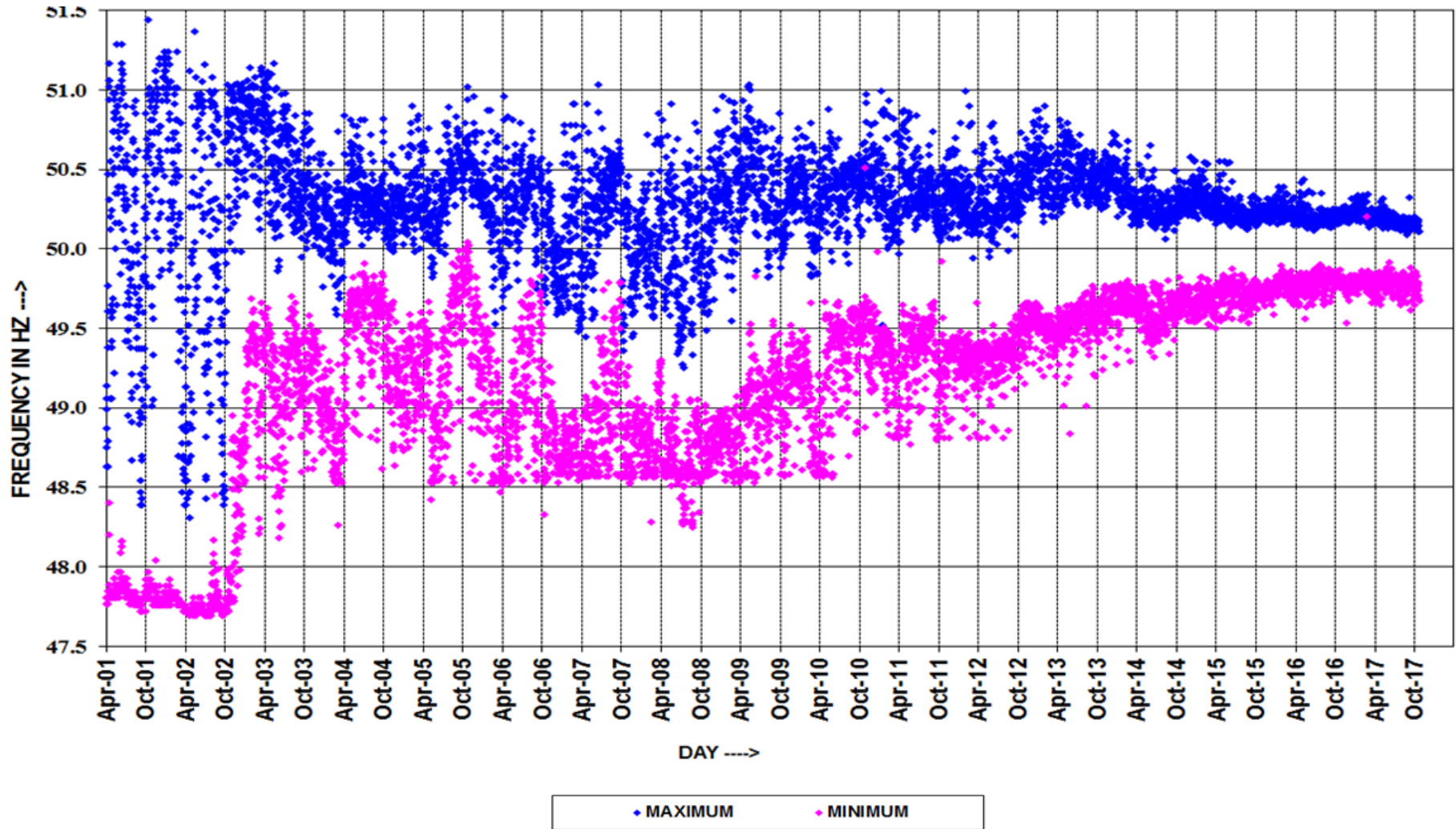
- **ABT mechanism was introduced in various regions in stages**
 - Western (1-Jul-2002), Northern (1-Dec-2002), Southern (1-Jan-2003), Eastern (1-Apr-2003) and North-Eastern (1-Nov-2003)
- **The main objectives of introduction of ABT mechanism at regional level have been:**
 - encourage grid discipline
 - economic load dispatch
 - promote trade in energy and capacity
 - encourage higher availability
- **Key benefits of ABT mechanism at regional level**
 - Improved grid frequency
 - Reduced frequency variations
 - Reduction of number of interruptions/grid failures
- **Successful implementation of ABT at regional level has firmed up belief that ABT mechanism (similar to mechanism at regional level) should be introduced at the State level.**

Maximum and Minimum Frequency Profile⁷



⁷ – Based on ER / NEW Grid Data
Source : POSOCO and CERC

Maximum and Minimum Frequency Profile Southern Region⁸

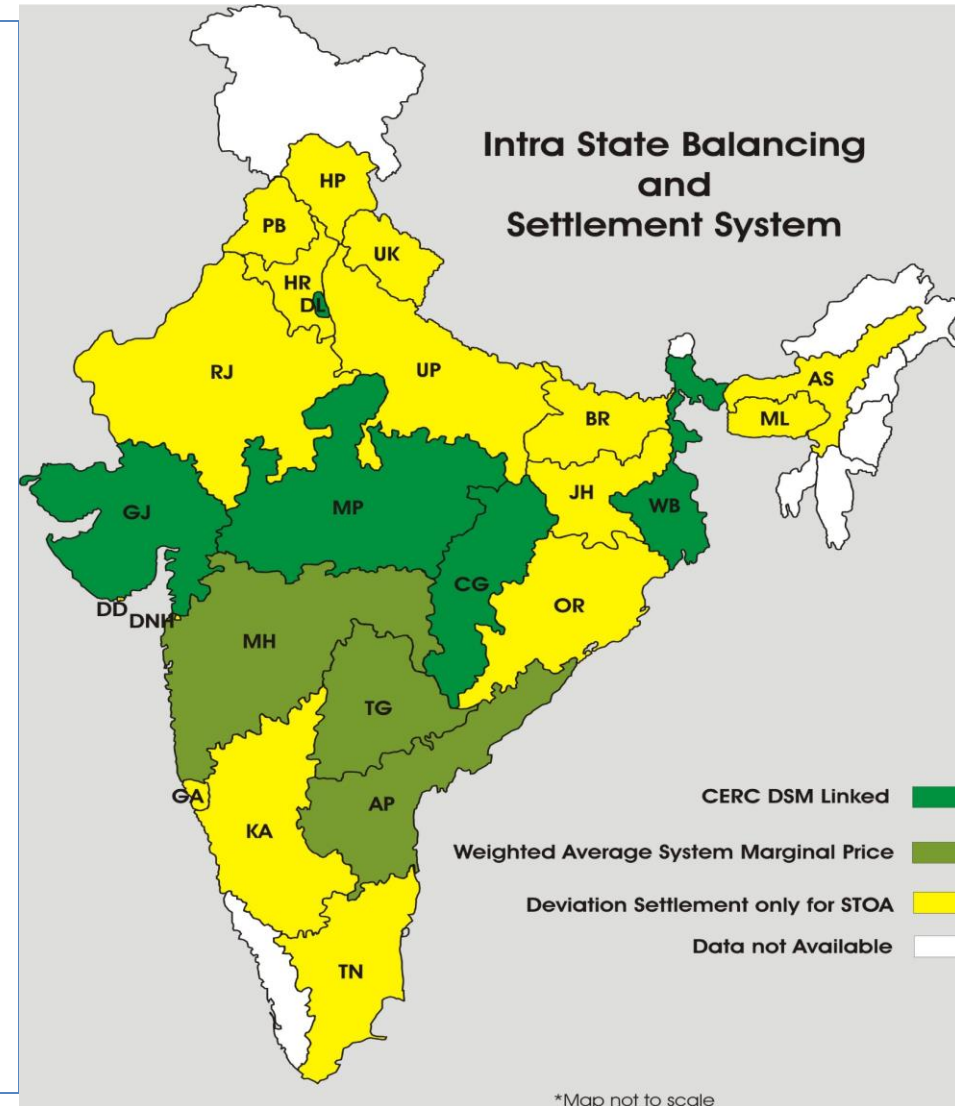


⁸ – Based on SR Grid Data till Dec'14 and All India Grid data thereafter

Source : POSOCO and CERC

Intra-state Balancing & Settlement : Mandate and status update

- Section 32 of Electricity Act 2003
- Section 5.7.1 (b) of National Electricity Policy 2005
- Section 6.2 (1) of Tariff Policy 2006 & 2016
- Recommendations of the Forum of Regulators – June 2006 and 2008
- Regulation 6.4.1 of Indian Electricity Grid Code 2010
- Recommendations of Niti Ayog for Renewable Integration – Feb 2015, Dec-2015
- Para 2.3.2 of the Pradhan Committee – 2008
- CERC Order on Roadmap for Reserves – Oct 2015
- CERC Framework for Forecasting Scheduling and Imbalance Handling for RES- Aug 15



– Objectives

- To ensure **secure and reliable grid operations** while bringing in more generation in the system
- To instill **forecasting and load management discipline** amongst Discoms, load serving entities and OA consumers
- To ensure **despatch discipline amongst generators** based on economic/ merit order principles
- To **serve as a balancing mechanism** within the state
- To **facilitate energy accounting and deviation settlement** of transactions in transparent manner

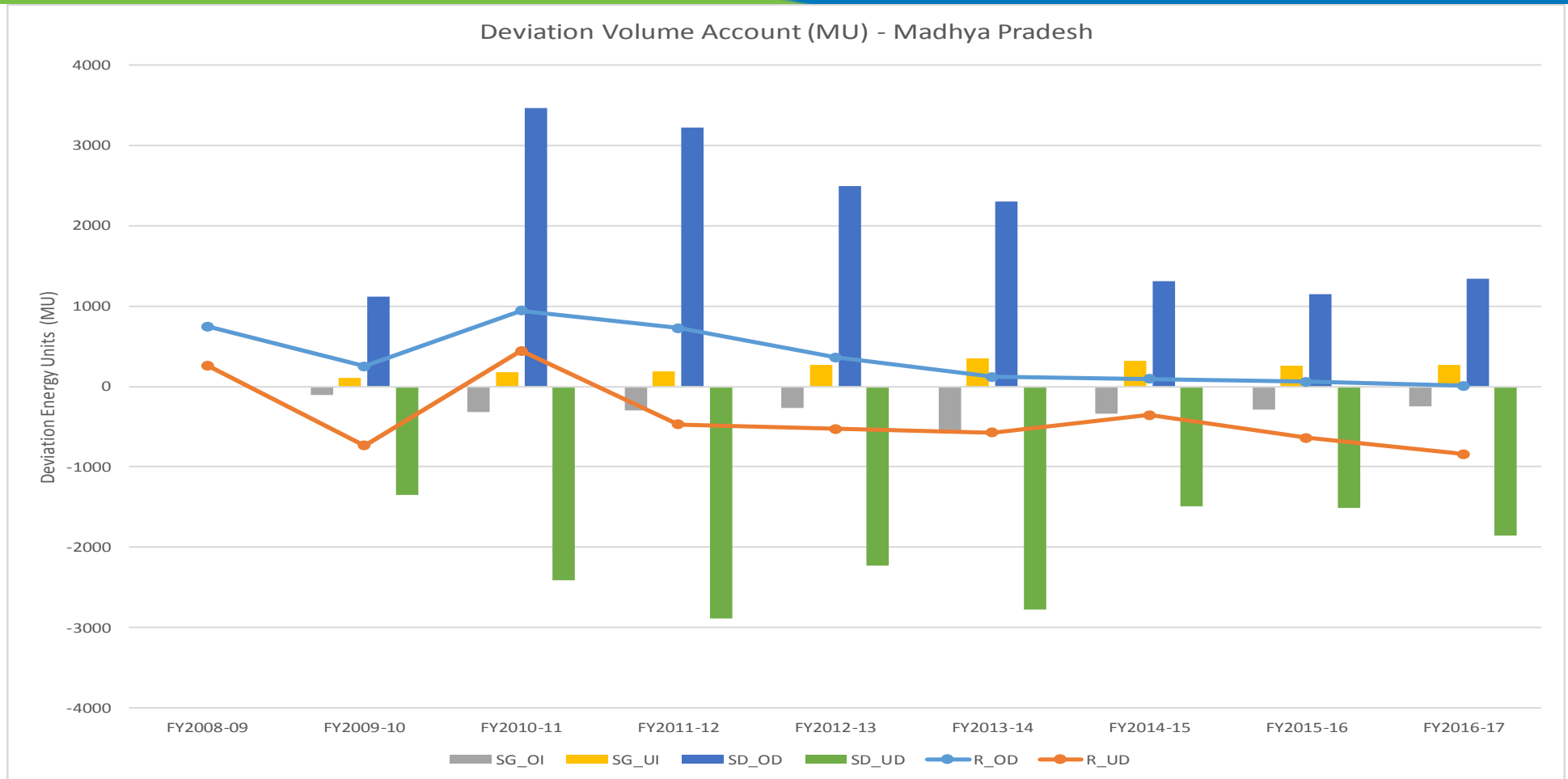
– Key Considerations

- Ensuring Grid discipline – Share of scheduled capacity mgmt at state periphery is ~ 18% to 35% of total capacity/volume handled for intra-state entities. Deviation management (by Volume) for intra-state entities is crucial.
- Cost Principle – Should not have significant **impact on Cost of power** in the state power system as a whole.
- Market Development Principle – The new system (balancing & settlement) should promote the development of market, i.e., **encourage participation by many buyers and sellers**
- Quality and Efficiency Principle - Quality of supply and the **efficiency of various entities/institutions** should improve.
- Should not be prone to Gaming – The devised mechanism **should not be favourable to** any Participant.

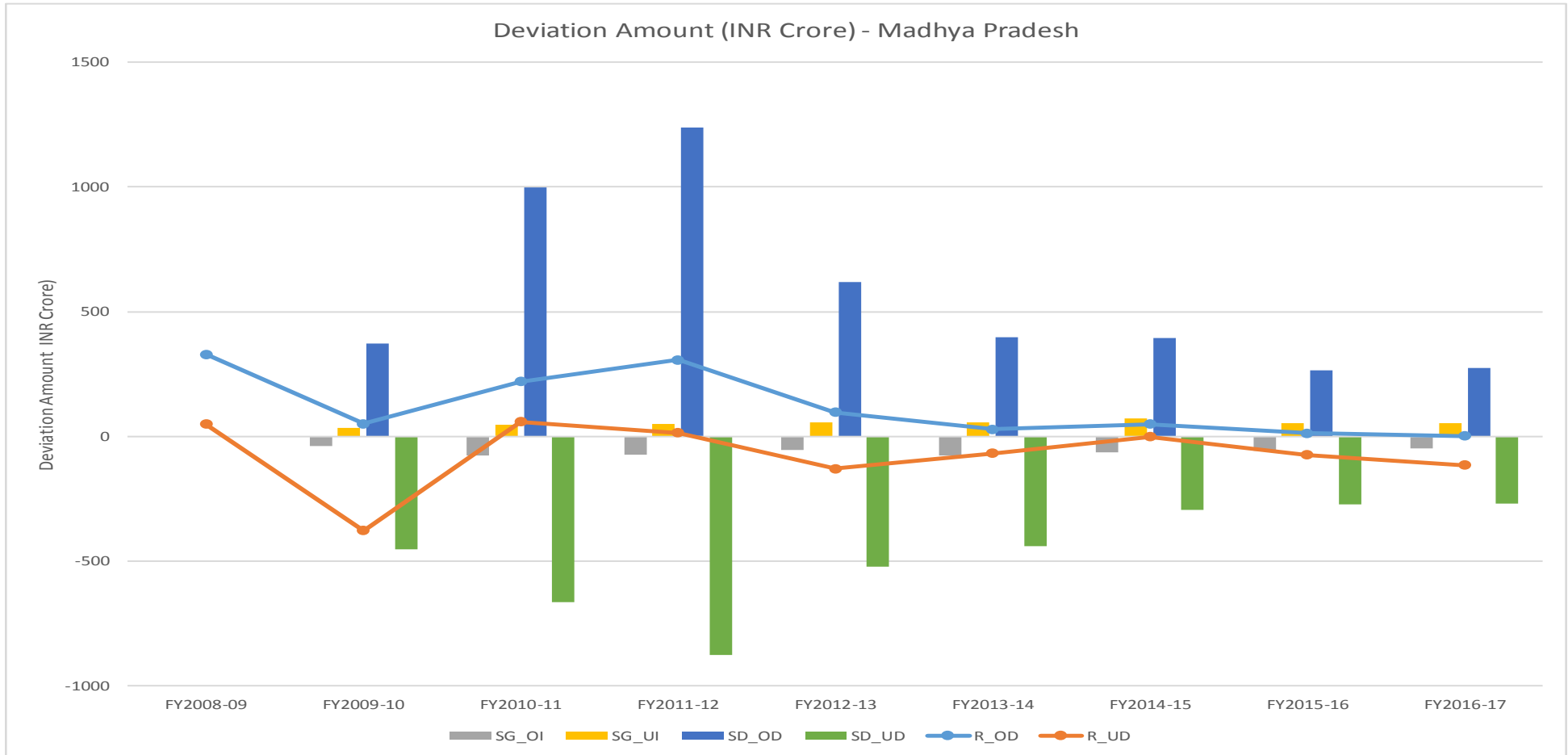
DSM : Experience of other States

- Madhya Pradesh Deviation Accounting
- Maharashtra weekly deviation data analysis

Madhya Pradesh : Deviation Account (MU) FY09 to FY17

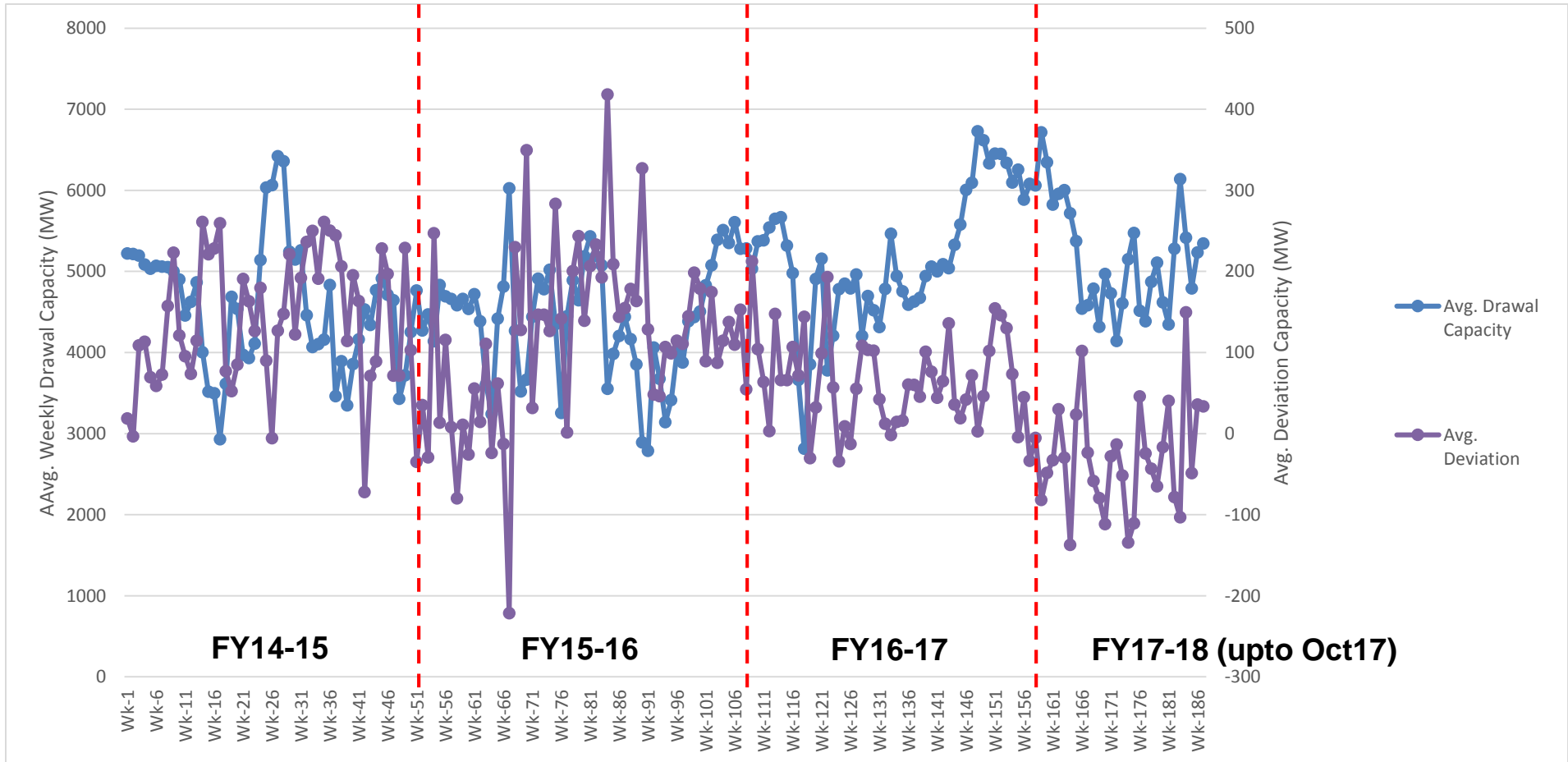


- Pre ABT and Post ABT : significant improvement over the period
- Improvement in Balancing/Deviation management by Intra-state entities over the period
- Share of energy units handled at state periphery is ~ 35% of total energy units handled for intra-state entities



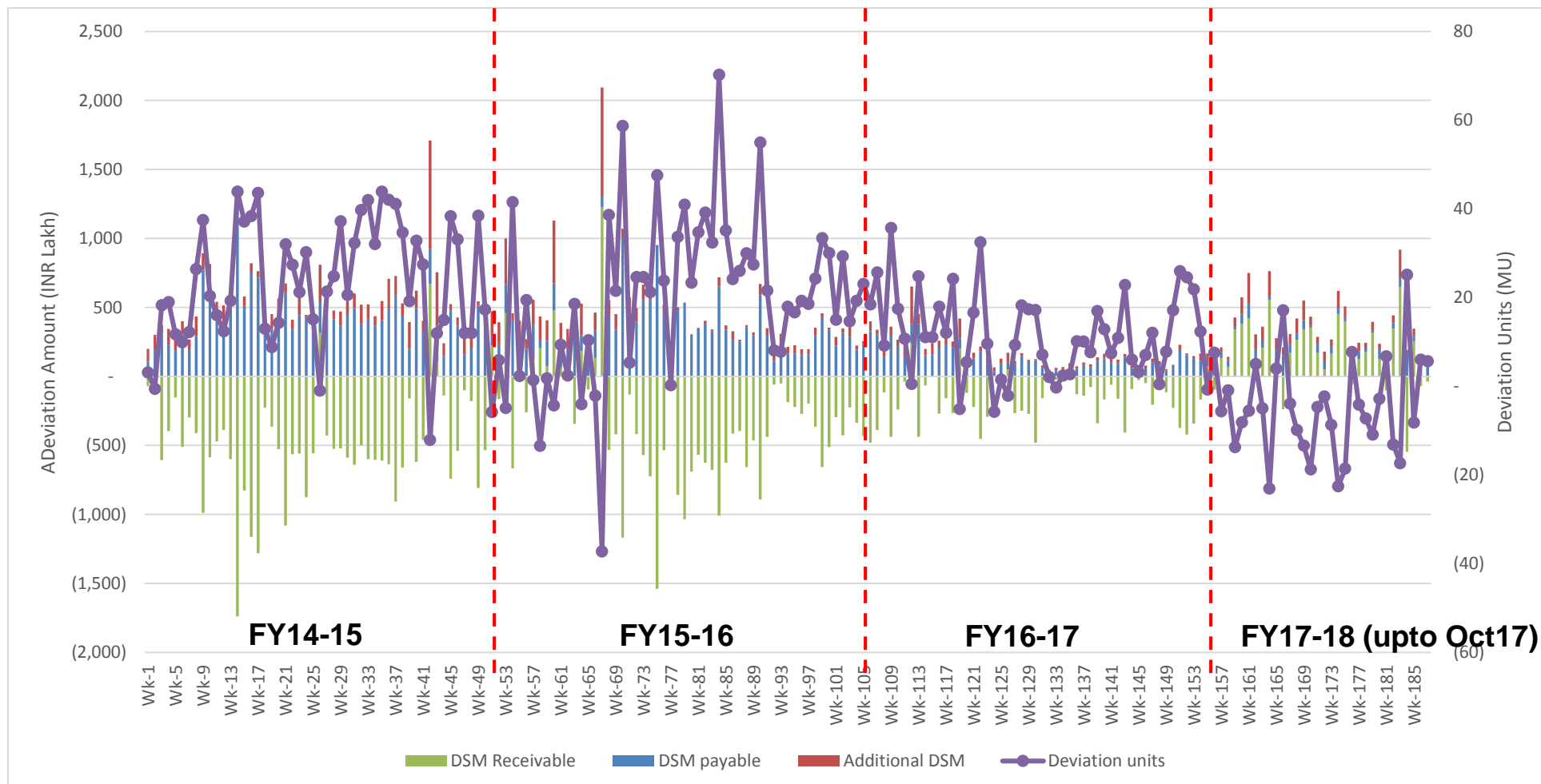
- Pre ABT and Post ABT : Improvement in Regional UI (payable/receivables) management
- No significant cost implications for Intra-state entities.
- Causer pays principle well established.

Maharashtra : Weekly Avg. Capacity Drawal and Avg. Deviation MW (FY15 to FY18 upto Oct17)



- Post ABT : Improvement in deviation management even after increase in avg. scheduled capacity from 4500 MW to 6000 MW at state-periphery

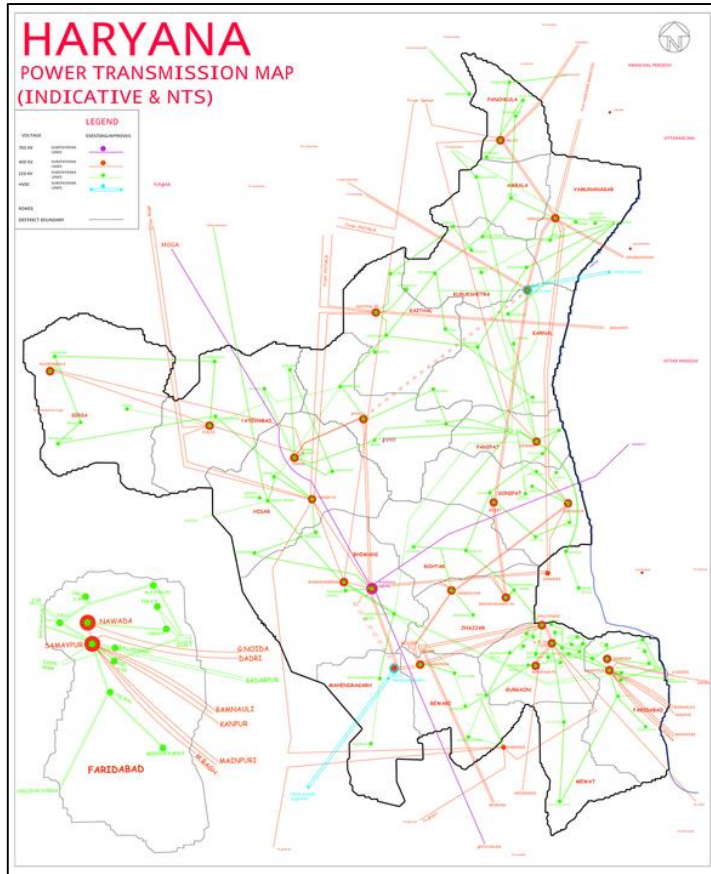
Maharashtra: Weekly Deviation Units and Charges - (FY15 to FY18 upto Oct17)



- Post ABT : Improvement in Regional UI (payable/receivables) management
- No significant cost implications for Intra-state entities.

Status update on activities for SAMAST implementation in Haryana

- Overview of State Profile
- Budgetary Cost Estimates
- Draft F&S Regulations for Haryana
- Draft DSM Regulations for Haryana



Peak Demand: 9262 MW
 Supply: 9262 MW
 No. of Transmission S/s: 412 no. of Substations
(Ref.: LGBR 2017-18 Report & HVPNL website)

Profile of State

Generation sources	Installed Capacity in MW	No. of Units
Thermal	6951	20
Hydro	1284	11
Wind	-	-
Solar	12.8	9
Other RE	353.2	-

Total Gen Cap. : 11180 MW
 IPPs: 3106 MW
 CPPs: 352 MW

(Ref.: HERC Annual Report 2014-15 & CEA Executive Summary Oct 2017)

No. of Distribution Licensees /SEZ: 2 no. (UHBN & DHBVN)
 No. of Transmission Licensees: 1 no. (HVPNL)
 No. of OA Consumers : 349 no. (LTOA/MTOA/STOA)
(Ref.: FOR - SAMAST Report, 2016)

Regulatory Developments:

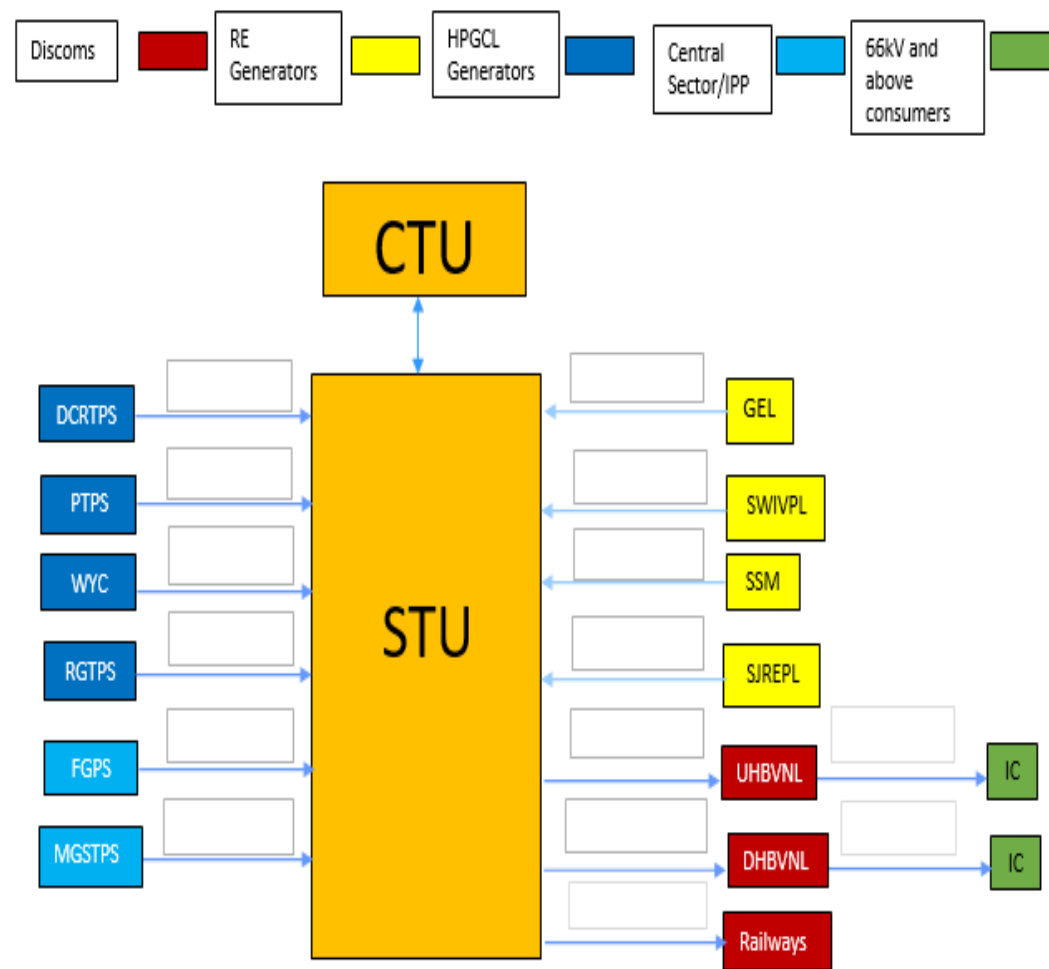
- Haryana falls under **Category 'B'** of SAMAST report (Deviation Settlement only for Open Access Consumers)
- Generators payment on actual basis
- MYT Tariff Regulations, 2012 specifies determination of Capacity Charge and Energy Charge of generators
- State Electricity Grid Code, 2009 and its amendments
- HERC Open Access Regulations 2012, specifies treatment to the Deviation of OA generators/consumers
- As per Grid Code requirement, Scheduling and Despatch Code has not yet been notified

- Consultant held Meetings/Presentations with HVPN & SLDC, Haryana under aegis of HERC on **13th November 2017** for SAMAST implementation at state level and to brief about Model F&S/DSM Regulations at state level.
- Consultant also visited **SLDC Haryana Energy Centre** to discuss and guide on various issues for preparing working draft DPR for SAMAST implementation in Haryana and shared the formats of DPR and templates for estimation with HVPN/ SLDC, Haryana.
- Based on the **preliminary information of Interface points and existing metering points** shared by HVPN/ SLDC, Haryana, consultant has prepared and shared the preliminary estimation for AMR and Hardware and software infrastructure to be developed under SAMAST.
- Further, the Consultant also discussed the **steps for formulation of separate Regulations for Forecasting & Scheduling framework and Deviation Settlement Mechanism for Haryana** on the lines of model F&S and model DSM Regulations.
- The State specific consideration and need for appropriate modifications was identified along with **need for Scheduling and Despatch code** for the State.
- Based on discussions with HERC, consultant has prepared the **Scheduling and Despatch code, Draft HERC F&S Regulations & Draft DSM Regulations** and submitted to HERC for review.
- Further, Discussion with HVPN and as per data provided by HVPN **draft DPR for SAMAST implementation in Haryana** has also been submitted to HVPN

Exiting ABT system under operation in Haryana

Boundary meters considered for preparation of Deviation Bill

Entities	Constituent	No. of feeders	Installed Main meters	Installed Check Meters
HPGCL Generating Stations (G<>T) (34 No.)	DCRTPS	8	8	8
	PTPS	11	4	4
	RGTPS	4	2	0
	FGPS	4	4	4
	MGSTPS	4	4	4
	WYC (Hydro)	3	3	3
IPP/CPPs (G<>T) (4 No.)	GEL (RE)	1	1	1
	SWIVPL (RE)	1	1	1
	SSM (RE)	1	1	1
	SJREPL (RE)	1	1	1
EHT/HT OA Consumers (T<>C) (40 No.)	OA (UHBVN)	15	15	2
	OA (DHBVN)	25	25	17
Distribution Licensees (T<>D) (1053 No.)	UHBVN	523	523	298
	DHBVN	522	522	321
	Railways	8	8	4
Total		1131	1122	669



Existing ABT Metering arrangement

Premise for cost estimation for SAMAST implementation in Haryana



- Estimation of quantities for Metering and Communication infrastructure is based on no. of Interface points, no. of intra-state entities as identified by HVPN.
- At present, **40 OA Entity** has been identified as connected to **transmission interface**. However, the same could increase in future.
- While **ABT meters are in place at interface points**, the cost of Metering infrastructure has been considered taking into account requirements to be compatible with future standards and communication.
 - Option-1: Existing meters (for conversion to 5-minute) to be explored (New meters - < 200)
 - Option-2: Replacement of entire metering arrangements (New meters - ~ 1150+)
- Cost Estimate of **Hardware Component-II** (Servers, storage, laptops etc), Software Component and Training and Capacity building is based on assumptions on similar lines for other States (AP, TN).
- **Preparation of DPR** by HVPN is in process. After preparation of DPR, **approval of Management** will be sought and then DPR will be submitted to PSDF appraisal committee for approval.

Summary of Budgetary Cost Estimation for Haryana DPR:



S. No.	Item Description	Cost Estimate	Cost Estimate incl. Contingency
		(INR Lakh)	(INR Lakh)
6	Summary of Key Cost Components		
6.1	Hardware component-I	1,373	1,415
6.2	Hardware component-II	193	203
6.3	Software component	536	563
6.4	Communication component	599	629
6.5	Infrastructure component	236	248
6.6	Training, Capacity Building & Annual Operating Cost	118	124
6.7	Contingency (est @ 3% on Metering and @5% on other cost)	125	
6.8	GRAND TOTAL	3,182	3,182

Item Description	Cost Estimate
	(INR Lakh)
Cost-Estimate - Hardware-Metering infrastructure	1,415
Cost-Estimate - Communication Component	629
Cost-Estimate - Software, Hardware-II, Infrastructure, Training & Capacity Building - SAMAST	1,138
COST ESTIMATE GRAND TOTAL	3,182

INR 1767 Lakh

Sr.	Particulars	FOR Model F&S Regulations	HERC F&S Regulations (draft)
1	Applicability	Wind and solar generators selling power within or outside the state	<ul style="list-style-type: none"> • Wind and solar generators connected to the InSTS, connected via pooling stations • selling power within or outside the State • installed capacity at Pooling S/S of 1 MW and above.
2	Forecasting and Scheduling Responsibility	Wind and solar generator or by QCA Or forecast by SLDC to be accepted	<ul style="list-style-type: none"> • Wind and solar generator or by QCA • Forecast by SLDC accepted
3	Computation of Error Formula	Available Capacity in denominator	<ul style="list-style-type: none"> • Absolute Error = $100 \times \{(\text{Actual generation} - \text{Scheduled Generation}) / \text{Available Capacity (AvC)}\}$
4	Tolerance Band for DSM	10% new wind and solar generator. < = 15% existing wind and solar generator	<ul style="list-style-type: none"> • Uniform tolerance band for Wind and Solar (+/-10%, +/-20%, +/-30%) • No distinction between Existing or New
5	Scheduling Requirement	Weekly and day-ahead with maximum 16 revisions during a day	<ul style="list-style-type: none"> • Weekly and day-ahead with maximum 16 revisions during a day
6	Generator Payouts linked to	<ul style="list-style-type: none"> • On Schedule basis (inter-state) • On Actual basis (intra-state) 	<ul style="list-style-type: none"> • On Schedule basis (inter-state) • On Actual basis (intra-state)
7	Deviation Pricing	<ul style="list-style-type: none"> • Linked to Fixed Rate/PPA (inter-state) • PU INR 0.50, 1.0, 1.50 (intra-state) 	<ul style="list-style-type: none"> • Linked to Fixed Rate/PPA rate (inter-state) • PU INR 0.50, 1.0, 1.50 (intra-state)

Sr.	Particulars	FOR Model F&S Regulations	HERC F&S Regulations (draft)
8	Reference point for DSM	Pooling station	<ul style="list-style-type: none"> Pooling Station (incl. Discom S/S) Existing RE Gen. need to be mapped. Definitions of Interconnection Point and Metering Point to be verified considering existing practices
9	Apportion of Energy Deviations & DSM Charges among RE generators at a pooling S/S	In proportion to actual generated units or available capacity	In proportion to actual generated units
10	Telemetry and Communication Requirement & Responsibility for providing telemetry and Communication	Data relating to power system output and weather By Generator	Data relating to power system output and weather By Generator/QCA
11	Procedure for Data Telemetry and Communication	Detailed procedure to be evolved by SLDC	Contours of Detailed procedure by SLDC have been outlined in Regulations
12	DSM For Sale Outside State Specified	Yes	Yes, subject to conditions (TBD)
13	Meeting Shortfall of DSM Pool	PSDF and NCEF	Net annualised impact of shortfall funding (virtual pool) apportioned to all RE Generators in proportion to their deviations

Draft HERC DSM Regulations, 2017 – Salient features(1/3)



Sr. No.	Ref of Draft Regulations	FOR Model DSM Regulations	Proposed Draft HERC DSM Regulations
1	Objective	To maintain grid discipline and grid security as envisaged under the Grid Code through the commercial mechanism for Deviation Settlement through drawal and injection of electricity by the users of the grid	To maintain grid discipline and grid security as envisaged under the Grid Code through the commercial mechanism for Deviation Settlement through drawal and injection of electricity by the users of the grid.
2	Applicability	Seller(s) and Buyer(s) involved in the transactions facilitated through short-term open access or medium-term open access or long-term access in intra-state transmission or distribution of electricity (including inter-state wheeling of power), as the case may be.	<ul style="list-style-type: none"> • All Seller(s) including OA Generating Station(s) but excluding Wind and Solar Generating Station(s) connected to InSTS or Distribution system in accordance provisions of HERC(Grid Connectivity and Intra-State Open Access Regulations), 2012. • Buyers(s) other than Distribution Licensees and Full Open Access Consumer(s) shall be governed in accordance with the provisions of Haryana Electricity Regulatory Commission (Grid Connectivity and Intra-State Open Access Regulations), 2012.

Sr. No.	Ref of Draft Regulations	FOR Model DSM Regulations	Proposed Draft HERC DSM Regulations
3	Limits for Deviation	<ul style="list-style-type: none"> • No over-drawal/under-injection when Frequency below 49.8 Hz. • No under-drawal / over-injection when frequency is above 50.05 Hz • Volume Cap for Intra-state Entities proposed as under: <ul style="list-style-type: none"> • For Generators /Sellers : 10 MW or 12% of Schedule, whichever lower • For DISCOMs/Buyers: X Limit or 12% of Schedule, whichever lower • In case of schedule is less than 40 MW, Volume cap of 5 MW or 12% of schedule, whichever higher. • Additional Charges at rate of 20%, 40%, 100% of Applicable Deviation Charges in steps of deviation 12%-15%, 15%-20%, > 20% or X+10 MW, X+ 20 MW, > X+ 20 MW 	<ul style="list-style-type: none"> • No over-drawal/under-injection when Frequency below 49.7 Hz • No under-drawal / over-injection when frequency is above 50.05 Hz • Volume Cap for Intra-state Entities proposed as under: <ul style="list-style-type: none"> • For Generators /Sellers : 10 MW or 12% of Schedule, whichever lower • For DISCOMs/Buyers: X Limit or 12% of Schedule, whichever lower • In case of schedule is less than 40 MW, Volume cap of 5 MW or 12% of schedule, whichever higher. • Additional Charges at rate of 20%, 40%, 100% of Applicable Deviation Charges in steps of deviation 12%-15%, 15%-20%, > 20% or X+10 MW, X+ 20 MW, > X+ 20 MW

Sr. No	Ref of Draft Regulations	FOR Model DSM Regulations	Proposed Draft HERC DSM Regulations
4	Charges for Deviation	<ul style="list-style-type: none"> Charges payable (over-drawal/under-injection) and receivable (under-drawal/over-injection) for each time-block with slope of 50 paise/unit per 0.01 Hz Linked to avg. freq (15 min duration) in steps of 0.01 Hz over range from 49.9 Hz to 50.05 Hz Change in sign of deviation once every 6 time blocks- violation attracts additional charges @10% of deviation charges applicable for the continuance of violation Cap Rate of Paise 303.04/ unit (indicated- to be linked through imported coal power plant) Charges for over injection / under drawal in excess of 12% of the schedule or 10 MW shall be zero. 	<p>Charges shall be accordance to CERC (DSM Regulations), 2014</p> <ul style="list-style-type: none"> Charges payable (over-drawal/under-injection) and receivable (under-drawal/over-injection) for each time-block with slope of 35 paise/unit per 0.01 Hz Linked to avg freq (15 min duration) in steps of 0.01 Hz over range from 49.7 Hz to 50.05 Hz Change in sign of deviation once every 6 time blocks- violation attracts additional charges @10% of deviation charges applicable for the continuance of violation Cap Rate of Paise 303.04/ unit (indicated- to be linked through imported coal power plant) Charges for over injection/ under drawal in excess of 12% of the schedule or 10 MW shall be zero.
5	Institutional Arrangement	<ul style="list-style-type: none"> State Power Committee to prepare Statement for Deviation Charges on Weekly basis State Load Despatch Centres to operate & maintain 'State Deviation Pool Account Fund' 	<ul style="list-style-type: none"> Haryana SLDC to prepare and maintain State Deviation Pool Account State Power Committee to co-ordinate and facilitate intra-state energy exchange SPC to monitor compliance of DSM Regulations by State Entities.

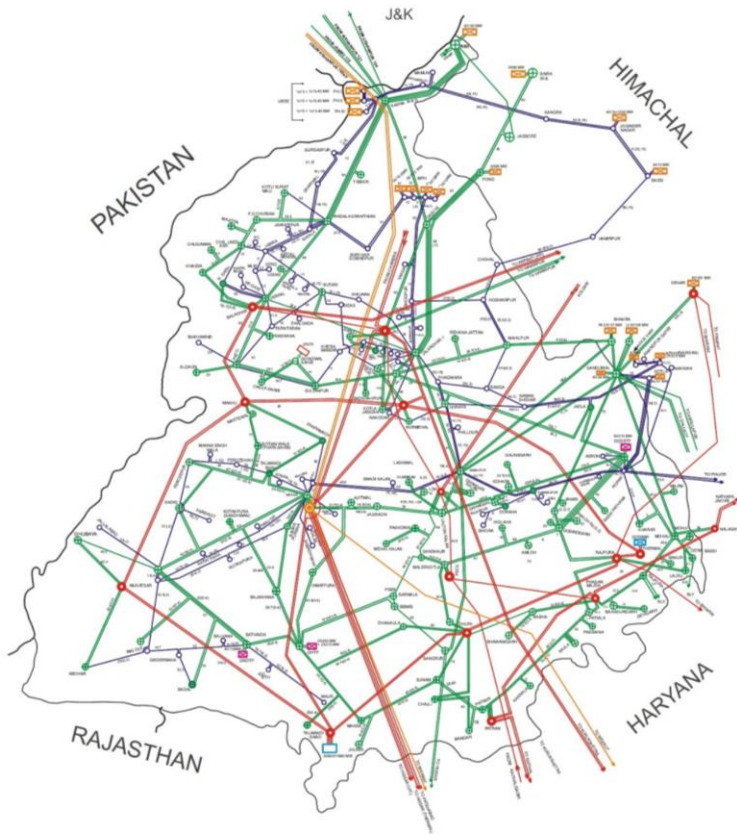
Next steps for Haryana (for discussion)



- Finalisation of DPR for SAMAST implementation with Management approval for further process
- Initiation of Regulatory Process for formulation and public consultation for Draft F&S Regulations at state level (Haryana)
- Initiation of Regulatory Process for formulation and public consultation for Draft DSM Regulations at state level (Haryana)
- Review of Grid Code and approval of Scheduling and Despatch Procedures/Code

SAMAST implementation in Punjab

- Overview of State Profile
- Existing ABT Infrastructure of Punjab
- Need for Functional segregation in Punjab
- Chronology and scope of activities



Peak Demand: 11408 MW
 Supply: 11408 MW
 No. of Sub-stations: 159 no. of Substations
(Ref.: LGBR 2017-18 Report & PIUNJABSLDC website)

Profile of State

Generation sources	Installed Capacity in MW	No. of Units
Thermal	7885	21
Hydro	2858	31
Wind	-	-
Solar	896	
Other RE	638.55	

Total Gen Cap. : 12277 MW
 IPPs: 1819 MW
 Total RE : 1534.55 MW

(Ref.: CEA Executive Summary Oct 2017; PUNJABSLDC & PEDAs websites)

No. of Distribution Licensees /SEZ: 1 no. (PSPCL)
 No. of Transmission Licensees: 1 no. (PSTCL)
 No. of OA Consumers : 458 no. (LTOA/MTOA/STOA)
(Ref.: As per info available on PUNJAB SLDC Website) (OA consumer – 248 as per SAMAST)

Regulatory Developments:

- Punjab falls under **Category 'B'** of SAMAST report
- Generators payment on actual basis
- MYT Regulations, 2014 and its amendments, PSERC MYT Regulation specifies provision determination of Capacity Charge, Energy Charge and Deviation Charges of generators
- State Electricity Grid Code, 2013 and its amendments, specifies Scheduling and Despatch code
- Intra-State Open Access Regulations, 2011 and its amendments, specifies treatment to the Deviation of OA generators/consumers

- Consultant had a meeting with Member, PSERC on 7th September, 2017.
- The consultant highlighted key features of SAMAST, implementation roadmap and elaborated on the steps for DPR preparation.
- Member, PSERC raised the **issue of functional segregation between generation and distribution function** of PSPCL, which would require further deliberations.
- The Consultant highlighted the **need for putting in place energy accounting framework and corresponding metering/communication infrastructure** in place and how SAMAST implementation would facilitate the same.
- Draft DPR, Data/Information templates were shared with STU/SLDC and interactions held with STU/SLDC to seek inputs as per SAMAST Check List. It is proposed to convene further meetings with STU/SLDC to take forward this initiative.
- Draft F&S Regulations for Punjab were shared with PSERC team and further interactions to finalise are necessary.
- Secretariat of the FOR suggested that, PSERC may interact with TNERC as Tamil Nadu state has also integrated generation and distribution business, and Tamil Nadu Commission has implemented function segregation for energy accounting purpose.

Exiting ABT system under operation in Punjab



Boundary meters considered for preparation of Deviation Bill*

Entities	Constituent	No. of feeders	Installed meters		
			Main	Check	Backup
PSPCL Generating Stations (G<>T)* (131 No.)	GNDTP	18	12	12	6
	GHTP	22	14	14	8
	GGSTPS	23	13	13	10
	UBDC HEP	10	4	4	6
	RS HEP	13	9	9	4
	SHANAN HEP	16	16	11	5
	AS HEP	9	9	5	4
	MUKERIAN HEP	20	8	8	12
IPP/CPPs (G<>T) (No.)					
EHT/HT OA Consumers (T<>C) (No.)					
Distribution Licensees (T<>D) (No.)	PSPCL				

Interface Points#	
G-T*	121
RES-T	0
ISTS-InSTS	62
D-T	398
HT-T	20
OA-T	0
Total	601

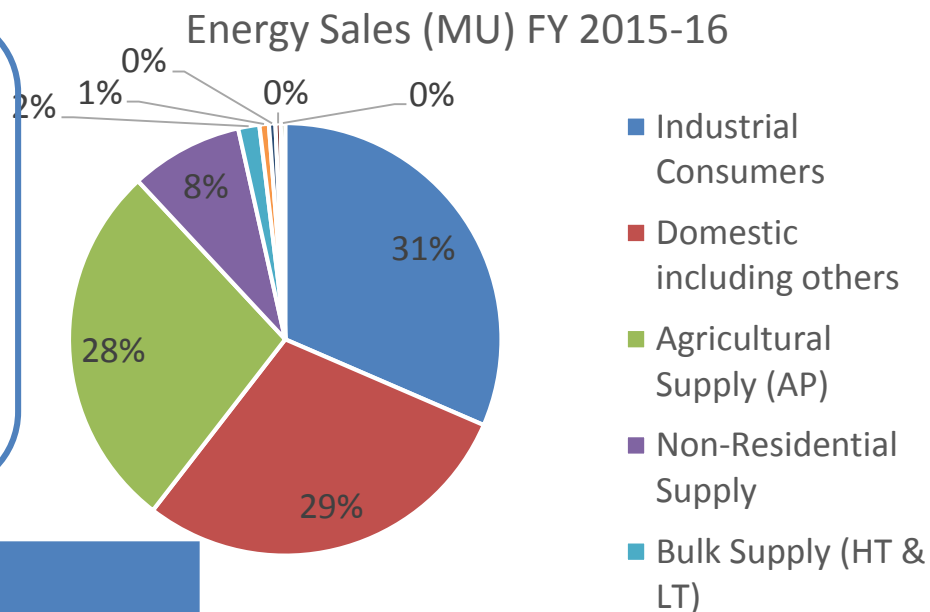
*Ref- As per information available on PUNJAB SLDC Website

Ref- FOR-SAMAST Report, 2016

Punjab MYT Tariff Order FY 2017-18 to FY 2019-20



- Average Cost of Supply FY 2017-18 is **Paise 642.45/kWh.**
- Pooled Cost of Purchase (APPC) FY 2017-18 is **Rs. 3.82/kWh.**
- PSPCL is scheduling its power procurement plan based on **merit order principles.**
- The Commission in its recent Tariff Order has decided to implement the **Two Part Tariff structure.**



Revised Tariff (Two Part) for FY 2017-18

S. no.	Category			Fixed Charges	Energy Charges
1	Large Supply (General Industry)	Above 100 kVA & upto 1000 kVA	All Units	140/kVA	5.70/kVAh
		Above 1000 kVA & upto 2500 kVA	All Units	195/kVA	5.74/kVAh
		Above 2500 kVA	All Units	230/kVA	5.78/kVAh
2	Bulk Supply	LT	All Units	155/kVA	6.25/kVAh
		HT	All Units	195/kVA	5.85/kVAh
3	Agricultural Pumpset (AP)		All Units	NA	5.06/kWh (without GoP subsidy) or Rs. 403/BHP/month
					Nil (with GoP subsidy)

- Total Deviation charges payable by Punjab FY 2016-17 is **78.632 Cr.**
* (Ref -NRLDC Annual Report 2016-17)

RECOVERY OF ENERGY CHARGES (VARIABLE CHARGES)

“The Energy Charge for generating plants of the distribution licensee/generating companies for the month shall be worked out on the basis of scheduled ex-bus energy to be sent out from the generating plant in accordance with the following formula:

$$\text{Energy (Variable) Charge (Rs.)} = \text{Energy Charge Rate (Rs. /kWh)} \times \text{Scheduled Energy (ex-bus) for the month (kWh)}$$

39.3 Variations between actual net injection and scheduled net injection for the generating stations, and variations between actual net drawal and scheduled net drawal for the beneficiaries shall be treated as their respective deviations and such deviations shall be governed by the Indian Electricity Grid Code & ABT, as implemented by the Central Electricity Regulatory Commission, and charges for such deviations shall be governed by the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2014, as amended from time to time or any subsequent re-enactment thereof. “

Segregation of Financial Statements of Distribution and Generation Business ...(1/2)



- “The Commission has apportioned the Employee Cost for MYT years to Generation and Distribution Business based on the Allocation Statement provided by PSPCL for FY 2015-16 vide Memo No.1178/CC/DTR/Dy.CAO/245 Vol-I/ deficiency dated 23.12.2016. Project wise Employee Cost of Generation Business is also allocated based on the same Allocation Statement of FY 2015-16...”

Table 5.32: Project wise Employee Cost - Hydro & Thermal (under Generation)

Projects	FY 2017-18	FY 2018-19	FY 2019-20
Shanan	23.17	23.95	24.91
UBDC	36.36	37.58	39.10
RSD	-	-	-
MHP	48.54	50.17	52.19
ASHP	33.51	34.63	36.03
Micro	-	-	-
BBMB	-	-	-
Total (Hydro) (A)	141.58	146.33	152.23
GNDTP	183.20	189.33	196.99
GGSSTP	276.01	285.25	296.79
GHTP	121.22	125.29	130.36
Total (Thermal) (B)	580.43	599.87	624.14
Total Generation (A)+(B)	722.01	746.20	776.37
Total Distribution	3966.29	4099.19	4264.89

Table 5.40: Project wise R&M and A&G Expenses- Hydro & Thermal

Projects	FY 2017-18	FY 2018-19	FY 2019-20
Shanan	1.10	1.42	1.54
UBDC	7.69	7.90	8.16
RSD	70.52	72.38	74.07
MHP	8.69	9.19	10.09
ASHP	4.73	4.88	5.04
Micro	0.23	0.24	0.25
BBMB	5.21	5.34	5.45
Total (Hydro) (A)	98.17	101.35	104.60
GNDTP	36.28	37.20	37.99
GGSSTP	33.06	34.01	35.40
GHTP	41.78	42.84	43.75
Total (Thermal) (B)	111.12	114.05	117.14
Total Generation (A)+(B)	209.29	215.40	221.74
Less: RSD, BBMB and GNDTP share (as discussed in para 5.12.7 to 5.12.9 above)	75.73	111.21	113.72
Generation (Net)	133.56	104.19	108.02
Distribution*	425.12	455.23	482.13

* Inclusive of ₹12.68 crore on account of License and ARR fees for all years of Control Period.

Segregation of Financial Statements of Distribution and Generation Business ...(2/2)



- PSERC directed PSPCL to segregate financial statements and Cost accounts for Generation and Distribution business. Relevant part of order dated 23.10.2017 is extracted as below:-

Directive *:-

“The Commission directs PSPCL to segregate the Financial Statements and Cost Accounts for Distribution and Generation (project wise) business for determination of tariff as per Regulation 5.1 of MYT Tariff Regulations. The Commission has taken the cost of each element as per the Allocation Statement provided by PSPCL for Distribution and Generation. The Allocation Statement shall not be accepted during true up of FY 2017-18 onwards without audited Financial Statements of project-wise Generating Projects and Distribution Business in accordance with Regulation 5.3 of PSERC MYT Regulations”

- ABT comprises 3 Part tariff i.e. Fixed Charges, Energy Charges and Deviation charges
- 3 part tariff can only be implemented when annual accounting information of generation business (for each generating station separately) and Distribution business is available.
- Segregation of Accounting Information shall entail : Station-wise Fixed Cost Components used for capacity charge determination
 - O&M expense (employee, R&M and A&G)
 - GFA and NFA (depreciation)
 - Loan and Interest
 - Op. Equity and Return on Equity
 - Working capital requirements
- PSPCL has not yet segregated annual accounts for its generation and distribution business, however PSPCL has submitted allocation statement to PSERC vide *Memo No.1178/CC/DTR/Dy.CAO/245 Vol-I/ deficiency dated 23.12.2016.*
- PSPCL needs to submit segregated audited Annual Accounts for distribution and generation business .

Experience of TamilNadu for functional segregation of generation and distribution business

Next steps for Punjab (for discussion)



- Initiation of steps for preparation of DPR for SAMAST implementation (as per CheckList)
 - Draft DPR template circulated
- Implementation of Functional Segregation of 'Generation' (Station-wise) and Distribution
 - Implementation by Utility (PSPCL) as per **directives under PSERC Tariff Order**
- Initiation of Regulatory Process for formulation and public consultation for Draft F&S Regulations at state level (Punjab)
 - Around **896 MW of Solar Capacity** already installed within state
- Initiation of Regulatory Process for formulation and public consultation for Draft DSM Regulations at state level (Punjab)
 - PSERC had directed PSTCL/SLDC to develop framework for **Intra-State DSM for state entities** vide its Order **dated 28 November, 2014 in Case 27 of 2014**. (FOR Model DSM Regulations)



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Thank You

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