भारत सरकार Government of India
विद्युत मंत्रालय Ministry of Power
उत्तर पूर्वी क्षेत्रीय विद्युत समिति
North Eastern Regional Power Committee
एन ई आर पी सी कॉम्प्लेक्स, डोंग पारमाओ, लापालाङ, शिल्लोंग-७९३००६, मेघालय
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No.: NERPC/COM/CC_Min/2018/***8090-8134*** Dated: 26.10.2022

To

1. CE (Commercial) -cum- CEI, Deptt. of Power, Govt. of Arunachal Pradesh, Itanagar- 791 111
2. MD, APDCL, Bijuli Bhawan, Paltan Bazar, Guwahati-781 001
3. MD, AEGCL, Bijuli Bhawan, Paltan Bazar, Guwahati-781 001
4. MD, APGCL, Bijuli Bhawan, Paltan Bazar, Guwahati-781 001
5. MD, MSPDCL, Secure Office Bldg. Complex, South Block, Near 2nd MR Gate, Imphal – 795 001
6. MD, MSPCL, Keishampat, Imphal – 795 001
7. Director (Distribution), MePDCL, Lumjingshai, Short Round Road, Shillong – 793 001
8. Director (Transmission), MePTCL, Lumjingshai, Short Round Road, Shillong – 793 001
9. Director (Generation), MePGCL, Lumjingshai, Short Round Road, Shillong – 793 001
10. Engineer-in-Chief (P&ED), Govt. of Mizoram, New Secretariat Complex, Khatla, Aizawl – 796 001
11. Engineer-in-Chief (P&E), Department of Power, Govt. of Nagaland, Kohima – 797 001
12. Director (Tech), TSECL, Banamalipur, Agartala – 799 001
13. Director (Generation), TPGL, Banamalipur, Agartala – 799 001
14. ED (Commercial), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
15. ED (O&M), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
16. ED (Commercial), NHPC, NHPC Office Complex, Sector-33, Faridabad, Haryana-121003
17. ED (O&M), NHPC, NHPC Office Complex, Sector-33, Faridabad, Haryana-121003
18. Group GM, NTPC Limited, Bongaigaon Thermal Power Project, P.O. Salakati, Kokrajhar-783369
19. GM (Commercial), NTPC Limited, ER-II HQ, Plot No. N-17/2, Naya Palli, Bhubaneswar-751012
20. MD, OTPC, Core 4 & Central, 10th Floor, SCOPE Minar, Laxmi Nagar, Delhi – 110092
21. ED, NERTS, PGCIL, Dongtieh-Lower Nongrah, Lapalang, Shillong -793 006
22. AGM (BD), NVVN, Core 5, 3rd floor, Scope Complex, 7 Institutional Area, Lodhi Rd., N. Delhi-3
23. Vice President, PTCIL, 2nd Floor, NBCC Tower, 15, Bhikaji Cama Place, New Delhi – 110066
24. Dy. COO, CTUIL, "Saudamini", 1st Fkoor, Plot No. 2, Sector-29, Gurugram, Haryana – 122001
25. Head & VP- Regulatory & Contracts, ENICL, Windsor Building, Near Raheja Centre Point, Off CST Road, Kalina, Santacruz (East), Mumbai-400098
26. ED, NERLDC, Dongtieh-Lower Nongrah, Lapalang, Shillong -793 006
27. Chief Engineer, GM Division, CEA, Sewa Bhawan, R.K. Puram, New Delhi – 110066

Sub: Minutes of the 46th Commercial Sub-Committee Meeting held on 27th September 2022

Sir,

Please find enclosed herewith the minutes of the 46th Commercial Sub-Committee Meeting held on 27th September 2022 at Hotel Vivanta by Taj, Faridabad for your kind information and further necessary action.

Encl.: As above

भवदीय / Yours faithfully,

(एस. एम. आइमोल / S. M. Aimol)
निदेशक / Director
वाणिज्य / Commercial

Copy to:

1. CGM (Comml), APDCL, Bijuli Bhawan, Paltan Bazar, Guwahati-781 001
2. ED (Comml), MSPDCL, Secure Office Bldg. Complex, South Block, Near 2nd MR Gate, Imphal-01
3. SE (EM), MePDCL, Lumjingshai, Short Round Road, Shillong – 793 001
4. S.E. (Commercial), Department of Power, Govt. of Mizoram, Khatla, Aizawl – 796 001
5. A.C.E. (Gen & Trans), Department of Power, Govt. of Nagaland, Kohima – 797 001
6. AGM (C&SO), TSECL, Agartala – 799 001
7. Head of SLDC, Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791 111
8. Head of SLDC, SLDC Complex, AEGCL, Kahilipara, Guwahati - 781019
9. Head of SLDC, MSPCL, Manipur, Imphal.
10. Head of SLDC, MePTCL, Lumjingshai, Short Round Road, Shillong – 793 001
11. Head of SLDC, Department of Power, Govt. of Mizoram, Aizawl – 796 001
12. Head of SLDC, Department of Power, Nagaland, Dimapur.
13. Head of SLDC, TSECL, Tripura, Agartala – 799 001
14. GM, Loktak HEP, NHPC Limited, Vidyut Vihar, Komkeirap, P.O. Loktak, Manipur – 795 124
15. AGM (Comml), NTPC Limited, 16th Rupalim Path, Rukhmini Nagar, Guwahati-781022
16. GM (Comml), OTPC, Core 4 & Central, 10th Floor, SCOPE Minar, Laxmi Nagar, Delhi – 110092
17. Head of the Plant, OTPC, Palatana, Kakraban, Gomati District, Tripura - 799116
18. MD, NETC, #2C, 3rd Floor, D-21, DMRC Building, Corporate Park, Sector-21, Dwarka, Delhi-77

(एस. एम. आइमोल / S. M. Aimol)
निदेशक / Director
वाणिज्य / Commercial

Minutes of 46th CCM

Govt. of India
Ministry of Power
North Eastern Regional Power Committee
Shillong

MINUTES OF THE 46th COMMERCIAL COORDINATION

SUB-COMMITTEE MEETING OF NERPC

Date **:** 27/09/2022 (Tuesday)

Time **:** 10:00 hrs

Venue **:** Hotel Vivanta by Taj, Faridabad

The 46th CCM of NERPC was held on 27th September, 2022 at Faridabad under the aegis of National Hydro Electric Power Corporation Ltd. (NHPC). The list of participants in the 46th CC meeting is attached as **Annex. –I**.

The meeting commenced at 10 am with singing of the National Anthem. This was followed by felicitation of delegates and lighting of ceremonial lamp by the senior officers.

Shri. R. P. Goyal, Dir (Fin), NHPC delivered welcome address and extended a warm welcome to all the delegates of the 46th CCM. He apprised the forum that the 2000 MW Lower Subansiri HEP will be commissioned in the next Financial Year. He also informed that the 2880 MW Dibang HEP in Arunachal Pradesh is under process of clearance with the Government of India. He wished that the meeting will resolve some of the long-standing commercial issues in NER.

Shri. B. Lyngkhoi, Member Secretary, NERPC welcomed the senior officers and all participants to the 46th CC Meeting. He thanked NHPC for hosting the meeting. While emphasising the importance of CC meetings, he expressed his desire that these meetings may be planned in advance so that senior officials of all organizations may participate to resolve all the issues amicably. He further informed that during CC meetings, relevant MoP/CERC regulations would be highlighted & discussed for the benefit of constituents and to improve the performance of the NER DISCOMs. He was concerned on the fact that the commissioned date of Lower Subansiri of August 2022 has not been met and as a result it would be difficult for NER constituents for planning their power procurement.

After the discussion of the agenda items, a technical session was conducted wherein following presentations were made:
(1) “Key practices adopted by APDCL to improve Efficiency and Commercial viability” by Shri Nilmadhab Deb, AGM, APDCL

(2) "Power Markets and Load Forecasting" by Shri Satyajit Ganguly, MD, NETC and by a team of M/s 50 HERTZ respectively.

(3) "Highlights of NITI Aayog Report on Power Distribution Sector & Reforms" by Shri A. Agrawal, DD, NERPC

Sh. S. M. Aimol, Director (Commercial), NERPC thanked all the participants for making it convenience to attend the 46th CC meeting out of their busy schedules. On behalf of NERPC Secretariat, he expressed immense gratitude to NHPC for hosting the meeting. He appreciated their warm hospitality and excellent arrangement for the meeting. He requested active support and cooperation from all the participants to facilitate a fruitful deliberation.

The point wise deliberations/discussions taken up during the 46th Commercial Committee meeting are as under:

C O N F I R M A T I O N O F M I N U T E S

1. CONFIRMATION OF MINUTES OF THE 45th COMMERCIAL SUB-COMMITTEE MEETING OF NERPC.

Minutes of the 45th CC Meeting held on 28th June 2022 at Hotel Classic Grande, Imphal, Manipur was circulated vide No.: NERPC/COM/CC_Min/2018/ 1842- 1885 dated 15th July 2022.

Deliberation of the Sub-committee

Director (Commercial), NERPC informed that no observation has been received from any of the constituents.

Therefore, the sub-committee confirmed the minutes of the 45th CCM.

The Sub-committee noted as above.

ITEMS FOR DISCUSSION

2. AGENDA ITEMS FROM NERPC

2.1. *Recent CERC Draft Regulations*

CERC/MoP has issued following Regulations/Rules:

1. Draft Electricity (Amendment) Rules, 2022.
2. Implementation of the "Electricity (Late Payment Surcharge & related matters) Rules, 2022.
3. Draft Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2022.
4. Draft Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (Third Amendment) Regulations, 2022.

This is for kind information of the members.

Deliberation of the Sub-committee

The salient points, significance and implication of the Draft Electricity (Amendment) Rules, 2022 and implementation of the "Electricity (Late Payment Surcharge & related matters) Rules, 2022 were highlighted by Shri Abhijeet Agrawal, DD, NERPC ***(Annex. -2.1 a & 2.1 b)***.

The salient points, significance and implication of Draft Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2022 were highlighted by Shri Sourav Mandal, Manager (SO), NERLDC ***(Annex. -2.1 c)***.

Member Secretary, NERPC apprised the forum about the significance and implication of Draft Central Electricity Regulatory Commission (Terms and Conditions of Tariff) (Third Amendment) Regulations, 2022 ***(Annex. -2.1 d).***

The Sub-committee noted as above.

2.2 *National Level Optimization of Surplus Generation Capacity*

The generating capacities are not being optimally utilized on many occasions. The capacity is available in the country but due to one-to-one agreement constraint, the generating capacity even though available cannot be utilized by the entity who due to some reason or the other is facing crisis. In order to have national level optimization, CEA has proposed to have a national level

mechanism and portal so that any state/ discom can use the surplus power from central generating stations of any region. The draft proposal is attached as **Annexure 2.2** for information and further needful.

It is requested that the inputs/comments on the subject Draft Proposal be forwarded to the Grid Management (GM) Division of CEA preferably before 30th September, 2022.

Deliberation of the Sub-committee

Director (Commercial), NERPC requested the constituents to furnish their comments to the Grid Management (GM) Division of CEA by 30th September, 2022.

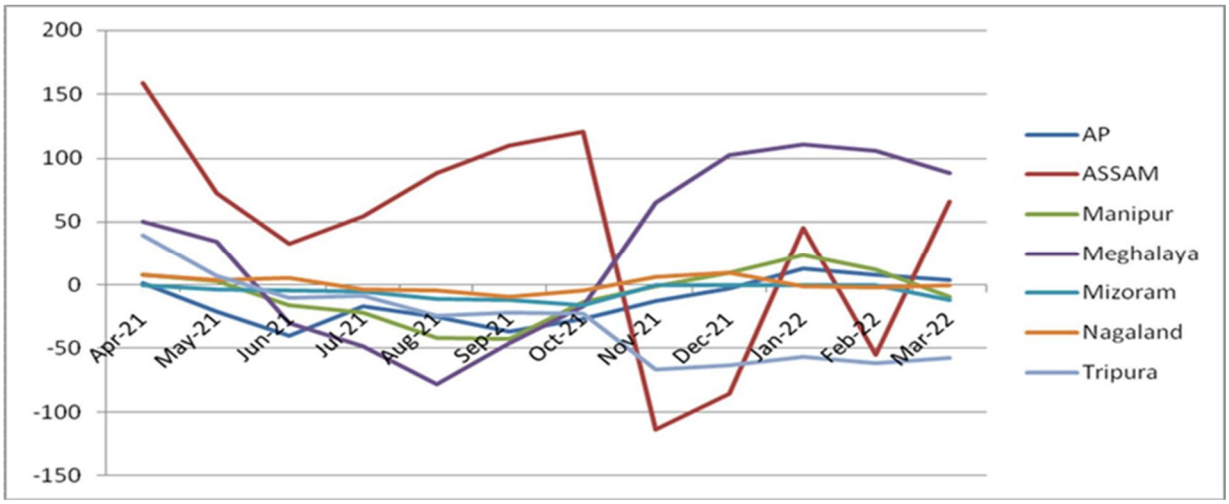
The Sub-committee noted as above.

Action: All Constituents

2.3 *Banking Arrangement within NER*

Load-generation patterns of one state may complement the other states. Presently, surplus/deficit power is being sold/bought in RTM; however, option of banking between the states may also be explored. CEA convened a meeting on 18.8.2022 to map the surplus/deficit period/quantum of states and their existing bankingarrangement, which is provided in the **Annexure 2.3.**

To further explore the possibility of banking within NER, following trend has been observed from the data of states' participation in short term/collective transactions for FY 2021-22.



(+ means Market Purchase; - means Market Sell in MW)

Deliberation of the Sub-committee

DD, NERPC apprised the forum that based on the historical data of market participation, there is a scope for complementing one state generation by the other state. This would in turn provide the states to exchange power among themselves with relatively less additional transmission charges.

The Sub-committee noted as above.

Action: All Constituents

2.4 Matters referred from OCCM

2.4.1 *Proposed Deemed grant of GNA in line with CERC (Connectivity and General Network Access to the ISTS) Regulations, 2022 (Agenda from CTUIL)*

As per Regulation 18.1(d) of CERC (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022 notification dated 19 -07- 2022, CTU as a Nodal Agency has to bi -furcate the Deemed GNA Quantum of STUs (as provided in **Annexure -2.4.1)** within 30 days of notification of these regulations into two parts as:

(i) GNA within the region

(ii) GNA from outside the region.

This bifurcation has to be in proportion to contracts, within the region or outside the region, under Long Term Access and Medium-term Open Access obtained in terms of Connectivity Regulation, 2009.

In this context CTU has prepared the bifurcation of Deemed GNA quantum of states and other entities within and outside the region based on LTA/MTOA contracts/CGS power allocation for the billing month Jul'22 under CERC sharing regulation 2020.

In the 193rd OCCM, the forum had requested the states to analyse their respective GNA quantum and its bifurcation and revert with feedback to CTU at the earliest. Also, it was stated that any need of further clarification and discussion would be looked into and might be undertaken in the next OCC meeting.

In 194th OCCM, the forum decided to refer the matter to the upcoming CCM.

Deliberation of the Sub-committee

After detailed deliberation, the constituents agreed to the data presented by CTUIL.

The Sub-committee noted as above.
Action: All Constituents

2.4.2 ***Fixed and energy charges of ISGS (Agenda from TSECL)***

Fixed and energy charges of ISGS is required to be published every month. In 194th OCCM, the forum decided to refer the matter to the upcoming CCM.

Deliberation of the Sub-committee

It was informed that the fixed and variable cost of the generating stations are available on the Merit Order Despatch Portal of the Ministry of Power. However, the subcommittee requested the ISGS to also display the data on their respective websites.

The Sub-committee noted as above.
Action: All ISGS

2.4.3 ***Reconstruction of Residential and Non -Residential Building at various stations of NERTS due to very dilapidated/non-livable condition (Agenda from NERTS)***

Residential and Non-Residential buildings were constructed at Haflong, Jiribam, Aizawl, Kumarghat, Salakati, Misa, Dimapur&Imphal under Additional Transmission for GohpurItanagar (A TGI), Chukkha project, Transmission System associated with Doyang HEP (Combined Element) and Transmission system associated with Loktak HEP respectively. These buildings were constructed in year starting from 1983 and have completed around 28 -39 years.

It is observed that due to ageing, these buildings have developed cracks and deteriorated and are not in liveable condition. In order to ascertain Structural Strength of these buildings, Structural Assessment of Residential& Non-residential buildings was carried out at Salakati, Haflong, Jiribam, Aizwal and Kumarghat through third party e.g., Bineswar Brahma Engineering College, Assam (Govt. institute AICTE approved).

Based on their assessment, it is found that the structures are quite unsafe and not in liveable condition. Further, it is mentioned that renovation may also not lead to any improvement in the strength of the buildings. In view of safety and security of employees (which are also a part of the system), it is not advisable to use these buildings for residential/non-residential use.

As manpower deployed in substations is an integral part of the system and since round the clock availability of manpower is essential for smooth O&M of these important Sub -stations, it is prudent that the residential / non-residential buildings are to be reconstructed as per present requirement.

Accordingly, as per present requirements, it is proposed for demolition and reconstruction of 16 nos quarters at Haflong, Jiribam, Aizawl & Kumarghat, 08 nos quarters at Salakati sub station, 20 nos. Residential quarters at Misa, Dimapur and Imphal Substation under O&M ADDCAP 2019 -24 tariff block. Moreover, 1 no Transit camp, and Admin building each at Haflong, Jiribam, Aizawl, Kumarghat, Dimapur and Imphal substation are also needs to be demolished and reconstructed under ADDCAP.

Accordingly, it is proposed for construction/demolition of buildings as per following details:

Name of Substation	**Const. Year**	**No of Quarters to be demolished**	**Nos of quarters to be Constructed**	**Estimated Cost (₹ In Cr.)**
ATGI Project				
Haflong	1987	16	16	4.36
Jiribam	1985	16	16	4.52
Aizawl	1988	16	16	4.21
Kumarghat	1989	16	16	4.38
Transmission System associated with Doyang HEP				
Misa	1994	20	20	5.48
Dimapur	1995	20	20	5.48
Transmission system associated with Loktak HEP				
Imphal	1983	20	20	5.48
Chukkha TS				
Salakati	1987	8	8	2.12

Name of Substation	Const. Year	No of Non residential Building to be demolished	Nos of Non residential Building to be Constructed	Estimated Cost (₹ In Cr.)
ATGI Project				
Haflong	1987	1 each	1 each	1.4 Cr
Jiribam	1985	1 each	1 each	1.4 Cr
Aizawl	1988	1 each	1 each	1.4 Cr
Kumarghat	1989	1 each	1 each	1.4 Cr
Transmission System associated with Doyang HEP				
Dimapur	1995	1 each	1 each	1.4 Cr
Transmission system associated with Loktak HEP				
Imphal	1983	1 each	1 each	1.4 Cr

** Non-Residential Building – 1 no Transit camp, and Admin building each

Estimated Cost for Demolition/Reconstruction for Residential & Non - Residentialbuildings under

a) ATGI project: ₹ 23.07 Crs
b) Transmission System associated with Doyang HEP project: ₹12.36 Cr
c) Transmission system associated with Loktak HEP project: ₹ 6.88 Crs
d) Chukkha TS: ₹ 2.12 Crs

The agenda has been taken up in 45th CCM wherein it was discussed that issue may be put up in subsequent NERPC forums. Accordingly, the agenda item has been taken up in 192nd OCC meeting wherein it has been finalized that discussion shall be held with counterparts in other regions and the forum shall be updated accordingly.

In view of above, it is requested to kindly accord consent for construction of new residential/non-residential buildings after demolition of existing ones at a financial implication as mentioned above in the respective stations/projects.

Deliberation of the Sub-committee

After detailed deliberation, the subcommittee decided to refer the matter to the next TCC/RPC meeting

The Sub-committee noted as above.

Action: NERPC

3. AGENDA ITEMS FROM ASSAM

3.1 *Agenda by APDCL:*

Bill raised to Arunachal Pradesh for Settlement of meter reading of 11 KV Rowing feeder and for transmission charge for power supply to Arunachal Pradesh through 33KV/11KV lines of Assam.

As per the minutes of 36th and 37th CCC meeting of NERPC, NERPC certified the transmission charges to be paid by Arunachal Pradesh to APDCL, Assam for power supply to Arunachal Pradesh through 33KV/ 11KV lines of Assam for the period of FY 2020-21. Accordingly, APDCL raised a bill to DoP, GoAP on 29.7.2022 for ₹ 2,23,82,165.00. As such, this is for deliberation of the forum with a request to the DoP, Govt of Arunachal Pradesh for the early settlement of the dues.

Deliberation of the Sub-committee

APDCL informed that payment has been received from DoP, Ar. Pradesh. Hence, the issue stands resolved.

The Sub-committee noted as above.

3.2 *Agenda by SLDC Assam:*

North East Frontier Railway has availed Long Term Open Access to evacuate power from its captive power plant BRBCL located in the state of Bihar. North East Frontier Railway has been allotted 5 MW as a share from its captive power plant. Since Railway has taken Long Term Open Access, it is a query of SLDC, Assam as whether Railway will be treated as a DIC like APDCL for the state of Assam or will it be treated as a state entity. Furthermore, if it is to be treated as a state entity, then how the applicable PoC in case of Railway will be taken care of.

Deliberation of the Sub-committee

DD, NERPC confirmed that Railways has an LTA of 5 MW. He further informed that Railways is a separate DIC paying the POC charges as per the Regional Transmission Accounts. Further AGM, APDCL informed that North East Frontier Railway is also a consumer of APDCL.

After detailed deliberation, the subcommittee advised APDCL to apprise and discuss with Railways regarding the implication of the present arrangement of

power connection to Railways.

The Sub-committee noted as above.

Action: APDCL

4. AGENDA ITEMS FROM TSECL

4.1 *Surrender of Power purchase by Manipur from Baramura GTP unit IV and V*

TSECL was exporting power to Manipur from Baramura Gas Thermal Power station as per bulk power supply agreement. As on date, outstanding with Manipur is around ₹ 41 Cr. including the late payment Surcharge (LPSC). On 27/05/2022 Managing Director, MSPDCL, Manipur vide letter no 2/29/2018/MSPDCL (comml)/2030 -33 dt 27/05/22 informed MD, TSECL that Manipur is Surrender Baramura Power from 1st J une,2022 onwards due to tariff revision from ₹ 3.01/kwh to ₹ 4.43/kwh. Presently exploring power to Manipur is discontinued.

The matter was also discussed in the last CC meeting. In the last CC meeting, Manipur has agreed to payment. TSECL has received around ₹ 8.0 Cr on 05/09/2022. Hence it is requested kindly to confirm the payment mechanism.

Deliberation of the Sub-committee

MSPDCL informed that the outstanding payment would be made & completed in 12 monthly instalments.

The Sub-committee noted as above.

Action: MSPDCL

4.2 *Outstanding Dues of Mizoram*

As on date, an amount of ₹ 12.0 crores is outstanding excluding the surcharge with Mizoram. It is to mention that TSE CL is to make timely payment to Gail/ONGC regularly to avoid surcharge etc as well as to avoid regulation of Gas supply. Therefore, Mizoram is requested to ensure monthly payment to avail rebate as well as to avoid surcharge, regulation of power supply etc .

LC of Mizoram is expiring on 10th October,2022. Request Mizoram to renewal

of LC in time.

Deliberation of the Sub-committee

SE, Mizoram informed that part payment has been made and the balance amount would be paid soon. Further he also informed the forum that LC would be renewed within the stipulated time.

The Sub-committee noted as above.

Action: P&E, Mizoram

4.3 *Allocation of merchant power from OTPC*

TSECL is facing power shortage during any outage of ISGS generation as well as state generation. Presuming that in outage scenario, TSECL has communicated to OTPC for allocating their Merchant power. In the commercial forum the matter was discussed so many times. Hence, NERPC is requested kindly to look into the matter so that TSECL can enjoy the merchant power on long term basis as an early date.

Deliberation of the Sub-committee

OTPC informed the forum that OTPC as a policy does not allocate power to entities with pending dues for more than 45 days. However, as TSECL has no outstanding dues currently, they may be considered for allotment of power after due internal approval. He further stated that the matter would be taken up with Competent Authority.

The Sub-committee noted as above.

Action: OTPC and TSECL

4.4 *Rescheduling of power from BgTPP*

After reallocating of BGTPP power to Tamilnadu, TSECL is facing huge shortage of power specially during any outage of ISGS or state Generation. The background of power surrender from BGTPP was high cost around ₹ 6.50/kwh in the year 2016. On that scenario TSECL has communicated to Ministry of Power for surrender. Presently the tariff of BGTPP has reduced to ₹ 5.60 approx after various consultations with the beneficiaries. Before reallocating BGTPP power to Tamilnadu, TSECL was totally unaware - no discussion/communication from MOP or NERPC/NERLDC.

In view of above scenario, TSECL is requested kindly to reschedule the BGTPP

share to TSECL.

Deliberation of the Sub-committee

After brief discussion, the subcommittee advised TSECL to take up the matter with MoP.

Action: TSECL

4.5 *Calibration of SEM meters (Bangladesh drawal) at Suryamani Nagar S/S.*

Collecting meter data for Bangladesh drawal from Suryamani Nagar S/S through vin plus software since March, 2016. On that basis bill raised by TSECL. The quantum of energy is also reflecting in the REA. Hence Calibration may be required in presence of Bangladesh officials. PGCIL is requested to take the necessary steps for calibration.

Deliberation of the Sub-committee

The subcommittee suggested TSECL to take up the matter in the OCC forum.

Action: TSECL

4.6 *General Network Access (GNA) for Tripura*

General Network Access (GNA) will be implemented very shortly. It has seen GNA for Tripura is 311MW based on the last three years average data. It is to mention that last three years average data consisting of Bangladesh drawal. Impact of GNA in the region is requested to discuss in the meeting. Earlier in POC regime, TSECL was paying around 3 Crores, but presently paying 11 to 12 crores.

Deliberation of the Sub-committee

DD, NERPC informed that the RTA charges are directly attributable to the number of elements installed in the state power network & explained the same using the RTA for the billing month of June, 2022

The Sub-committee noted as above.

5. AGENDA ITEMS FROM NEEPCO

5.1 *Outstanding dues of beneficiaries payable to NEEPCO as of 21.09.22 are as follows:*

(in crores INR)

State	Principal dues (>45 days)	Late Payment Surcharge (LPS) Due	**Total Due (Principal + LPS)**	The current amount is yet to be due (< 45 days)
1	2	3	4=2+3	5
APDCL, Assam	0	0	**0**	109.9
P&E Deptt, Mizoram	0.33	0	**0.33**	50.71
MSPDCL, Manipur	21.38	0	**21.38**	43.78
TSECL, Tripura.	103.7	0	**103.7**	90.43
DoP, Ar. Pradesh.	0	0	**0**	0
DoP, Nagaland.	0	0	**0**	13.61
MePDCL,Meghalaya.	0	0	**0**	30.05
CSPDCL, Chhattisgarh	0	0	**0**	3.66
HPPC, Haryana	0	0	**0**	3.66
UPPCL,Uttar Pradesh	1.49	0	**1.49**	0
Total	126.9	0	**126.9**	345.8

The above statement reflects an alarming situation. Yet, it has to be appreciated that some states are paying regularly and some are trying hard to clear the dues.

Due to the accrual of such outstanding dues, NEEPCO is facing difficulty to meet its day-to-day expenditure including fuel costs required for operating its thermal power stations. In the interest of extending better service to its beneficiaries, NEEPCO earnestly requests all the beneficiaries to make the payment on a regular basis.

Deliberation of the Sub-committee

MSPDCL informed that they would be paying in instalments. Tripura informed that outstanding dues above 45 days would be paid by October 2022. P&ED, Mizoram informed that part payment has been done & the balance payment would also be made soon.

The Sub-committee noted as above.

Action: MSPDCL, TSECL, P&E Deptt, Mizoram

5.2 *Strengthening of evacuation system of Pare HEP of NEEPCO and capitalization of the expenditure to be incurred for it for the implementation of the scheme:*

The above Agenda was discussed in the 192nd OCC Meeting, dated 21.07.2022 and as per the MoM, all beneficiaries are requested to give their consent on the capitalization of expenditure to be incurred for the implementation of the scheme. The total financial involvement for the Strengthening of the evacuation system of Pare HEP (i.e., upgradation of LILO portion) stands at Rs. 4.31 Crores (inclusive of all taxes& duties) and the amount of the charges would be nominal on the beneficiaries for the span of 40 years.

The relevant para of the MOM of the 192nd of OCC Meeting is reproduced as follows:

DD, NERPC noted that as NEEPCO is a generating utility the transmission works undertaken by NEEPCO cannot be booked under Transmission Tariff and has to be shared by the beneficiaries of Pare HEP.

AGM (Comml), APDCL informed the forum that Final tariff of Pare HEP is yet to be approved by Hon'ble CERC. He also informed that as part of the Tariff Petition Agreement of APDCL with NEEPCO dated 16.08.2021 was submitted to the Hon'ble CERC, in which NEEPCO and APDCL have agreed for tentative levelized tariff of ₹ 5.75/ unit for 40 years with no escalation. However, he stated that APDCL is open to Reviewing the agreement and submit the same to Hon'ble CERC.

DoP Nagaland agreed with the view of APDCL. While other State utilities decided to await for directions of Hon'ble CERC in this regard.

The forum in principle agreed to the requirement of the above works and requested NEEPCO to go ahead with the work.

It was also decided that:

(i) Assam and Nagaland would revise their agreements with NEEPCO and submit the same to Hon'ble CERC.

(ii) NEEPCO would submit Supplementary copy to its Original Tariff Petition of Pare HEP to Hon'ble CERC.

(iii) NEEPCO would place the agenda in the next CCM/RPC for approval.

Further to the above, the issue was also discussed in the **6th Standing Committee Meeting of NER** held at Imphal dated 03.10.2016 and following additional/ modification in the transmission system associated with Pare HEP was agreed as a part of NERSS -IX. (Agenda No. 6) – related pages are enclosed at **Annexure -5.2 A.**

a. Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi - Naharlagun / Nirjuli 132 kV S/C line – ISTS byNEEPCO.
b. Pare HEP (from LILO point) – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra conductor) along with 2 no. 132 kV line bays at North Lakhimpur – ISTS (implementation through TBCB/RTM to be decided by empowered committee).
c. LILO of one circuit of Pare HEP – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra) at Nirjuli substation – ISTS (implementation through TBCB/RTM to be decided by empowered committee).
d. Re-conductoring of LILO portion at Pare end (of Ranganadi – Naharlagun / Nirjuli 132kV S/c line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP – ISTS by NEEPCO.

Under 6.4 of the above items, Director, CEA stated that to recover additional investment in the transmission and bay equipment modification as suggested above, M/ s NEEPCO may file revised tariff petition in CERC.

Out of above 4(four) scopes, b & c are being executed by M/s Sterlite Power Transmission Ltd as TBCB contractor.

For (a) & (d), Chairman and Managing Director of NEEPCO communicated with Chairperson, CEA on 05.11.2020 requesting the scopes allocated to NEEPCO may kindly be carried out through the TBCB contractor or the expenditure may be granted from PSDF/MoDONER as the same is under strengthening scheme. The letter is enclosed as **Annexure-5.2 B.**

Subsequently, several meetings were held on the issue but CEA did not agree to the request **(Annexure - 5.2 C & 5.2 D**) and asked NEEPCO to execute the work as per modalities as discussed in the meeting dated 18. 11.2021 **(Annexure -5.2 E).**

The scheme of execution of work was discussed and approved in presence of CEA, NERPC and M/s Sterlite Power Transmission Ltd. in the meeting dated. 08.04.2022. (**Annexure -5.2 F**).

Based on above, an offer was collected from M/s Sterlite Power Transmission Ltd. for both (a) & (d) scopes amounting to **Rs. 3,65,20,119.00** which is exclusive of F&I and taxes and duties. With GST, financial involvement stands at **Rs. 4,30,93,740.00** (**Annexure -5.2 G**).

Since TBCB contractor is M/s Sterlite Power Transmission Ltd., it is prudent to execute the small portion of work which is entrusted to NEEPCO through the same executing agency otherwise there is every chance of mismatching of commissioning schedules of these three lines if a third party is engaged by NEEPCO. Moreover, longer outages of the three lines may also be required.

In view of the above and as per the decision of the 6th Standing Committee Meeting of NER and MoM of the 192nd OCC Meeting of NERPC and as suggested by CEA, the forum is requested their consent to recover the above-mentioned additional investment in the transmission system at Pare HEP end as explained above.

Therefore, the above is placed for deliberation and decision in the house under theaegis and guidance of NERPC.

Deliberation of the Sub-committee

AGM, APDCL stated that as part of the Tariff Petition Agreement of APDCL with NEEPCO filed to the Hon'ble CERC, NEEPCO and APDCL have agreed for levelized tariff of ₹ 5.75/ unit for 40 years which does not have any scope for Additional Cap. NEEPCO informed that for the benefit of beneficiaries, the tariff of Pare HEP has been decreased from ₹ 7.23 to ₹ 5.75. However, this strengthening is a requirement which needs to be executed.

Member Secretary, NERPC appreciated APDCL's view, however, he emphasized that NER constituents are the beneficiaries of Pare HEP and the work is important which needs to be taken up at the earliest. After much deliberation, the Sub-committee decided to refer the matter to TCC/RPC.

Action: NERPC

6. AGENDA ITEMS FROM NERLDC

6.1 *Deviation Pool Account outstanding*

Status of Deviation charges outstanding as on 16/09/2022 is attached ***(Annexure -6.1).***

Manipur is the major defaulter. Manipur – Net O/s Payable to Pool is ₹ 2.32 Crores [Deviation Principal, ₹ 1.44 Crores + Deviation Interest, ₹ 0.88 Crores].

Break -up of Deviation Interest of Manipur (in ₹)	
Wk-01 to Wk-26 of FY 20-21	4001350
Wk-27 to Wk-52 of FY 20-21	2736295
Wk-01 to Wk-25 of FY 21-22	263217
Wk-26 to Wk-51 of FY 21-22	1757223
Total	8758085

Clearance of O/s payable had been regularly followed up.

Manipur is requested to take immediate necessary action in this regard.

All the pool members are requested to clear outstanding payable due within the stipulated time to avoid late payment interest.

Deliberation of the Sub-committee

MSPDCL informed that the deviation outstanding dues would be cleared soon.

The Sub-committee noted as above.

Action: MSPDCL

6.2 *Reactive charges outstanding*

Status of Reactive charges outstanding as on 16/09/2022 is attached ***(Annexure - 6.2).***

O/s Payable to Reactive Pool by Manipur - ₹ 7.53 Lakhs. O/s Payable by Meghalaya - ₹ 66.09 Lakhs. O/s Payable by Mizoram - ₹ 17.43 Lakhs.

Manipur, Meghalaya & Mizoram are required to take necessary action.

All the pool members are requested to clear outstanding payable due within the stipulated time to avoid late payment interest.

Deliberation of the Sub-committee

MSPDCL, MeECL & P&E Dept, Mizoram informed that respective payment would be made shortly.

The Sub-committee noted as above.

Action: MSPDCL, MeECL & P&E Dept, Mizoram

6.3 *Signing of DSM & Reactive Reconciliation Statements*

Status of signing of Reconciliation statements of DSM & Reactive as on 16/09/2022 is attached in **Annexure -6.3**

1. Pending DSM reconciliation with – Manipur (1 Quarter) & NHPC (1 Quarter).
2. Pending Reactive reconciliation with – Manipur (1 Quarter).

Manipur & NHPC are requested to sign the reconciliation statements as early as possible.

Deliberation of the Sub-committee

NERLDC informed that Reconciliation in respect of NHPC has been received. MSPDCL also informed that the verified reconciliation statement would be communicated to NERLDC shortly.

The Sub-committee noted as above.

Action: MSPDCL

6.4 *Opening of LC against Deviation Charges Liability*

As per CERC (Deviation Settlement Mechanism and related matters) Regulations 2014, the LC amounts pertaining to NER entities are mentioned below (Refer **Annexure -6.4)**: -

Constituents	**LC to be opened in FY 22 -23 (₹ in Lakhs)**	Present Status
Ar. Pradesh	**242.48**	LC of ₹ 182.36 Lakhs, valid till 31/03/2023, to be enhanced
Assam	**318.99**	LC of ₹ 203.29 Lakhs, valid till 01/12/2022, to be enhanced
Manipur	**40.07**	LC Not opened/Not intimated
Meghalaya	**80.07**	Sufficient amount retained in Pool
Mizoram	**44.02**	LC of ₹ 44.02 Lakhs, valid till 4/02/2023.
Nagaland	**74.18**	LC of ₹ 74.18 Lakhs, valid till 20/03/2023.

Tripura	**205.57**	LC of ₹ 144.00 Lakhs, valid till 18/11/2022, to be enhanced

It is requested to open/enhance LC to adhere to CERC stipulation.

Deliberation of the Sub-committee

All concerned constituents agreed to extend and or enhance the requisite LC within stipulated time. However, Tripura requested NERLDC to send a letter to TSECL for LC validity extension & enhancement. MSPDCL informed that all the LC related issue would be resolved shortly.

The Sub-committee noted as above.

Action: Ar. Pradesh, Assam, Manipur, Tripura & NERLDC

6.5 *Signing of RLDC Fee and Charges Reconciliation Statements*

NERLDC Fee and Charges Reconciliation Statements for Q1 for FY 2022 - 23 was issued on 27/07/2022. We have received Signed/Reconciled copy from few users.

All remaining users are requested to send the signed Reconciliation Statements at the earliest.

Deliberation of the Sub-committee

Concerned constituents were requested to verify & send the signed statements at the earliest.

The Sub-committee noted as above.

Action: All concerned constituents.

6.6 *Procurement of SEM & DCD/Laptop for future requirements*

NERTS may intimate the status of procurement of Additional 40 nos. of DCD.

In 192nd OCCM, CTU informed that order for 40 DCDs has been placed to PGCIL and shall be made available by Oct'22 and in case of emergency diversion from inventories in other regions can be done.

CTU had also given presentation on "Process of Procurement, Distribution and Installation of SEM/DCD along -with Billing mechanism and charges". The forum requested all the DICs to submit comments regarding presentation of CTU latest by 31st July'2022.

In 193rd OCCM, after detailed deliberation the forum decided to discuss the matter in CCM.

Deliberation of the Sub-committee

Member Secretary, NERPC informed the members that the matter has been amicably resolved in the 194th OCCM under the item: Confirmation of minutes of 193rd meeting of Operation Sub-Committee of NERPC.

The Sub-committee noted as above.

7. AGENDA ITEMS FROM NERTS

7.1 *Outstanding dues*

The total outstanding dues (pertaining to both PoC as well as non -PoC billing) payable by NER beneficiaries to CTUIL/POWERGRID as on **20.09.2022** is detailed below: -

(All Figures in ₹ Crores)

State/ DIC	Outstanding dues > 45 days	Total Outstanding dues	Remarks
Ar. Pradesh	0.02	8.44	*Approx. 01 month receivables*
APDCL, Assam	0.00	50.78	*Approx. 01 month receivables*
MSPDCL, Manipur	**23.24**	29.60	*Approx. 03 months receivables*
MSPCL, Manipur	**0.61**	0.71	*Approx. 06 months receivables*
MeECL, Meghalaya	**5.00**	11.43	*Approx. 02 months receivables*
Mizoram	**23.02**	27.28	*Approx. 3 months receivables &Bilateral bills*
Nagaland	0.00	6.89	*Approx. 01 month receivables*
TSECL, Tripura	0.00	10.01	*Approx. 01 month receivables*
NEEPCO	**124.43**	124.43	*Bilateral bills*

Concerned DICs with >45 days outstanding dues, viz. MSPDCL, Mizoram, MeECL, NEEPCO & MSPCL may be impressed upon to clear the outstanding dues immediately since POWERGRID and other transmission licensees (on behalf of whom CTUIL does the billing & collection) are facing financial

constraints due to accumulation of such huge outstanding dues.

Deliberation of the Sub-committee

Mizoram informed that some amount has been paid and the balance payment would also be processed shortly. NEEPCO informed that the payment to POWERGRID would be made soon.

The subcommittee requested other concerned constituents also to clear the payments at the earliest.

Action: All concerned Constituents

7.2 Status of LC of NER beneficiaries (as per new requirement)

As it is known to all concerned, Central Transmission Utility of India Ltd (CTUIL), a subsidiary of POWERGRID, has started functioning as CTU w.e.f. 01.04.2021 as per notification dated 09.03.2021 issued by MoP, GoI and accordingly, the Billing, Collection and Disbursement of transmission charges (*for PoC billing*), a function of CTU, is being undertaken by CTUIL with effect from 01.04.2021.

Consequent to above, separate LCs in favour of CTUIL (*for PoC Billing)* and POWERGRID (*for non -PoC billing*) in place of existing LCs, which are in favour of POWERGRID, are to be maintained by DICs in line with provisions of Regulation 19 of CERC Sharing Regulations, 2020 and to avail CTUIL rebate scheme for FY 2022-23.

The status of LCs (as ***per above new requirement***) of NER DICs as on 20.09.2022 is as follows:

State/ DIC	**LC in favour of CTUIL (for PoC billing)**	**LC in favour of POWERGRID (for Non-PoC billing)**
Arunachal Pradesh	Available **(Enhancement required)**	**Not Available**
APDCL	Available	Available
MSPDCL	Available **(Enhancement required)**	-
MSPCL	-	**Not Available**
MeECL	Available	Available
Mizoram	Available	Available
Nagaland	Available	Available
TSECL	Available	Available

Arunachal Pradesh and **Manipur** may be impressed upon to enhance their LCs to the requisite amounts.

Deliberation of the Sub-committee

The subcommittee requested Arunachal Pradesh and Manipur to comply with the CERC regulations and enhance their LCs to the requisite amounts.

The Sub-committee noted as above.

Action: Ar. Pradesh & Manipur

8. AGENDA ITEMS FROM OTPC

8.1 *Outstanding Dues of OTPC against NER beneficiaries*

The current total outstanding dues of OTPC against the NER beneficiary states (as on 20-09-2022) are as under:

SN	Beneficiary	Outstanding Dues (>45 Days)	Total Outstanding
1	Mizoram	10.80	17.17
2	Tripura	35.81	75.04
3	Manipur	2.13	12.24
	Total	**48.74**	**104.45**

The total outstanding dues of above states as on 20-09-2022 are ₹ 104.45 Crores out of which outstanding beyond 45 days is ₹ 48.74 Crores. Tripura, Manipur and Mizoram are requested to clear the outstanding dues over 45 days, at the earliest. The forum is also requested to impress the urgency of the liquidation of dues in view of MoP guidelines for encashment of LC/Regulation of power and non -scheduling of power by RLDC.

Deliberation of the Sub-committee

Tripura informed that the outstanding dues has been cleared. Mizoram informed that part payment has been done & the balance outstanding would also be paid soon. Manipur has informed that payment would be done shortly.

The Sub-committee noted as above.

Action: Mizoram & Manipur

ANY OTHER ITEMS

9.1 *Category wise hourly load data requirement for the last 5 years for different States.*

India has announced a target to achieve net zero emissions by the year 2070. In this context, CEA, Ministry of Power in collaboration with Danish Energy Agency (DEA) under Indo -Denmark Partnership program, is carrying out generation expansion planning studies which will focus on Power Sector Development in India for a horizon of up to 2050. The planning studies are underway for whichextensive data inputs are required.

In this regard, CEA has requested from all the respective State Discoms and SLDCs to furnish historical demand/load data on hourly basis for different consumer categories viz. Domestic, Industrial, Commercial, Agriculture, etc. for the last 5 years (ie, 2017-18 to 2021-22) in order to carry out the abovestudies effectively.

It is therefore requested that the data pertaining to the following may kindly be furnished in respect of your State Discoms/SLDCs.

(1) *Historical demand/ load data on hourly basis for different consumer categories viz. Domestic, Industrial, Commercial, Agriculture, etc. for the last 5 years (ie, 2017 -18 to 2021 -22) (whatever is available)*

(2) Plans for shifting agricultural load to solar hours.

(3) Views of SLDCs/Discoms on future load patterns.

A format for furnishing above information is given at ***Annexure -9.1***

Kindly furnish as per the attached format and mail to: nerpc.commercial@gov.in by 30th September 2022.

Deliberation of the Sub-committee

Director (Commercial), NERPC requested the constituents to furnish the data as requested at the earliest.

The Sub-committee noted as above.

Action: All Constituent States

DATE AND VENUE OF NEXT COMMERCIAL COMMITTEE MEETING

Deliberation of the Sub-committee

The sub-committee requested ENICL (INDIGRID) to host the next i.e. 47th Commercial Coordination Sub-committee meeting. INDIGRID has agreed to host the meeting. The 47th CCM will be held in the month of December 2022. The date and venue will be intimated separately.

****

Annex- I

List of Participants in the 46th CCM held at Vivanta by Taj, Faridabad on 27th September, 2022				
S. No	**Name of Delegates**	**Designation**	**Contact No**	**Email**
1	Sh. Indrajit Tahbildar	AGM (TRC), APDCL	8761049486	indra.nits@gmail.com
2	Sh. Nilmadhab Deb	AGM (F&A), APDCL	8638867278	-
3	Ms. Priyanka Bhuyan	AM, SLDC, AEGCL	8638761291	-
4	Ms. Neeha Hazarika	Jr. Manager, SLDC, AEGCL	8876892037	-
5	Sh. Usham R. Singh	DGM (Comml), MSPDCL	7005096098	-
6	Sh. Th. Satyajeet Singh	Manager (Comml), MSPDCL	8415945818	satya14may@gmail.com
7	Sh. H.Jyrwa	SE (EM), MePDCL	9436103558	-
8	Smt. R.G.L.Mawlong	EE (EM), MePDCL	-	-
9	Sh. A. Shabong	Dy.Chief Accounts Offcier, MeECL	-	-
10	Sh. Daniel Nongrum	AO, MeECL	9862611853	meecl_cao@yahoo.co.in
11	Sh. Benjamin L.Tlumtea	SE (Comml), Mizoram	9436151424	-
12	Sh. S.I. Asangba Tikhir	Executive Engineer, Nagaland	7085508502	-
13	Sh. Debabrata Pal	Sr. Manager (Comml), TSECL		
14	Sh. Munin Choudhury	GM (Comml), NEEPCO	8787891254	munin99@gmail.com
15	Sh. Subodh Kumar Pradhan	Addl GM, NTPC	9437049168	-
16	Sh. Ashish Shrivastav	Head-Commercial, OTPC	9958995890	ashish.shrivastav@otpcindia.in
17	Sh. Utkarsh Katre	Executive (Comm.), OTPC	9125313788	-
18	Sh. Anupam Acharya	Chief Manager, NERTS	9402106974	-
19	Sh. Abhijit Daimari	Chief Manager, NERTS	9485187441	a.daimari@powergridindia.com
20	Sh. Deepak Pandey	A.V.P., PTC	9560055646	-
21	Sh. Lokendra S.Ranawat	Head Regulatory, ENICL	9311279183	-
22	Sh. Vivek Karthikeyan	Senior Manager, ENICL	8966903034	-
23	Sh. Himanshu Shekhar	ED (Comm.), NHPC	-	-
24	Sh. Ajay Srivas	GM, NHPC	-	-
25	Sh. Onkar Yadav	GM, NHPC	-	-
26	Sh. Mahesh Sharma	GM (F), NHPC	-	-
27	Sh. Md.Farman	DGM (Com), NHPC	-	-
28	Sh. Virendra Kumar	DGM, NHPC	9419029053	-
29	Sh. Rajesh Joshi	G.SM (E), NHPC	-	-
30	Sh. Rajesh Kumar	GSM (M), NHPC	9816654889	-
31	Sh. N. K. Singh	NHPC	-	-
32	Sh. B.Kumar Paswan	DM (E), NHPC	9906907828	-
33	Sh. Babul Roy	DGM, NERLDC	9436335377	-
34	Sh. Sourav Mandal	Manager, NERLDC	9402102354	-
35	Sh. Satyajit Ganguly	MD, NETC	9599775616	-
36	Sh. Rajesh Gupta	Director (Projects), NETC	9910378110	-
37	Sh. Rajeev Maggo	CFO, NETC	-	
38	Sh. Ritesh Kumar	Executive HoD, NETC	9868804280	-
39	Sh. B.Lyngkhoi	Member Secretary, NERPC	9436163419	ms-nerpc@gov.in
40	Sh. S. M. Aimol	Director (Comml), NERPC	8974002106	smaimol@gmail.com
41	Sh. Abhijeet Agrawal	EE (Comml), NERPC	9871266951	a.abhijeet123@gmail.com
42	Sh. Rajib Das	AE, NERPC	9454947474	d.rajib2009@gmaill.com

DRAFT AMENDMENTS IN ELECTRICTY RULES 2022

- *ELECTRICITY RULES 2005*

(SECTION 176 OF EA 2003)

- CAPTIVE POWER GENERATORS
- DISTRIBUTION SYSTEM
- TRANSMISSION AVAILABILITY
- REDRESSAL FORUM /. OMBUDSMAN
- APPEAL COURTS
- COGNIZANCE

5. Compliance with the directions by Transmission Licensee.-

(1) The National Load Despatch Centre, Regional Load Despatch Centre, as the case may be, or the State Load Despatch Centre, may, under section 26, sub-section (3) of section 28, sub-section (1) of section 29, sub-section (2) of section 32 and sub-section (1) of section 33 read with clause (b) of section 40 of the Act, give such directions, as it may consider appropriate for maintaining the availability of the transmission system of a Transmission Licensee and the Transmission Licensee shall duly comply with all such directions.

(2) The Appropriate Commission, on an application filed by the National Load Despatch Centre, the Regional Load Despatch Centre or the State Load Despatch Centre and after hearing the Transmission Licensee, if satisfied that the Transmission Licensee has persistently failed to maintain the availability of the transmission system, may issue such directions to the National Load Despatch Centre, the Regional Load Despatch Centre or the State Load Despatch Centre to take control of the operations of the transmission system of such Transmission Licensee for such period and on such terms, as the Commission may decide.

DRAFT AMENDMENTS IN ELECTRICTY RULES 2022

- *AMENDMENTS*
  - CENTRAL POOL
  - INTERMEDIARY PROCURER
  - UNIFORM RE TARIFF
  - TIMELY RECOVERY OF POWER PURCHASE COST
  - SUBSIDY ACCOUNTING
  - RESOURCE ADEQUACY PLANNING
  - ESS (AS POWER SYSTEM ELEMENT AS PER S/S 50 OF SEC 2)

(b) "**central pool**" means pool of category specific power from ISTS connected renewable energy sources being procured by the authorized Intermediary Procurers under Section 63 of the Act and as per provisions of Bidding Guidelines notified by the Central Government, from time to time for supply to the End Procurers of more than one State so that such power from renewable energy sources can be supplied to all End Procurers from the concerned Pool at Uniform tariff under the Rules.

(e) "**intermediary procurer**" means company, *designated* by an order made by the Central Government under these Rules as an intermediary between the End Procurer and the generating company to purchase electricity from generating companies and resell it to the End Procurer by aggregating the purchases or otherwise under Guidelines issued by the Central Government from time to time;

(h) "**uniform RE tariff**" means the tariff, computed by Implementing Agency on a monthly basis separately for each category of Central Pool (viz. Solar Power Central Pool, Wind Power Central Pool etc.), at which the Intermediary Procurer(s) shall sell power from renewable energy from that Central Pool to all the End Procurers under these Rules;

14. **Timely recovery of power purchase costs by Distribution Licensee:** The Appropriate Commission shall within ninety days of publication of these Rules, specify a price adjustment formula for recovery of the costs, arising on account of the variation in the price of fuel, or power purchase costs. The impact in the cost due to such variation shall be automatically passed through in the consumer tariff, on a monthly basis, using this formula. Such monthly automatic adjustment shall be trued up on annual basis by the Appropriate Commission.

(2) FPPAS shall be calculated and billed to consumers, automatically, without going through regulatory approval process, on monthly basis, according to the formula, prescribed by the respective State Commission, subject to true up on annual basis as decided by the State Commission.

Provided that the automatic pass through shall be adjusted for monthly billing in accordance with these Rules.

month. For example, the FPPAS on account of changes in tariff for power supplied during the month of April of any financial year shall be computed and billed in the month of June of the same financial year.

Provided that in case the distribution licensee fails to compute and charge FPPAS within this time line, except in case of any force majeure condition, its right for recovery of costs on account of FPPAS shall be forfeited. In such cases, the right to recovery the FPPAS determined during true-up shall also be forfeited.

(4) The Distribution licensee may decide, FPPAS or part thereof, to be carried forward to the subsequent month in order to avoid any tariff shock to consumers, but the carry forward of FPPAS shall not exceed a maximum duration of two months. Such carry forward shall only be applicable, if the total FPPAS for a Billing Month, including any carry forward of FPPAS over the previous month(s) exceeds 20% of variable component of approved tariff. The carry forward shall be recovered in the same financial year. The

IMPLEMENTATION RULES OF LPS BY MINISTRY OF POWER

The LPS Rules 2022 provides for regulation of access to power in case of non-payment of dues, one month after the due date of payment or two and half months after the presentation of bill by the generating company, electricity trading licensee or the transmission licensee, as the case may be, whichever is later. As such, a period of 2.5 months is adequate enough to settle the regular bills by the distribution licensees. The over dues of prior period i.e. up to 3rd June 2022 are being liquidated through EMIs as per the Rules for which financial assistance is also available from REC/PFC/FIs/Banks.

I. Suppliers (CPSEs/IPPs/REs/CTU) must update the details of invoices presented to DISCOMs on the PRAAPTI Portal within 5 days (including any holidays) of date of Invoice (DOI). The date of presentation of bill (DOP) to DISCOMs shall also be entered by the Generator on the portal, which shall form the anchor date in respect to determination of due date and default trigger date on the portal in line with provisions of the ibid rules.

II. The portal will auto check this period of 5 days and suppliers shall not be allowed to update details of Invoices beyond this period in any case.

III. An automated email would be sent to designated Email-ID of DISCOMs upon entry of any new invoice on the portal along with basic details of invoice including bill amount, bill due date and default trigger date.

IV. The default trigger date shall be generated by the Portal as per the Rules on the basis of due date and date of presentation of bill.

VI. DISCOMs may provide their inputs regarding prima facie incompleteness, if any, against the Invoices updated by the Suppliers on the Portal with the approval of Competent Authority of DISCOMs (not lower than the Director level of DISCOM) within 10 days (including any Holidays) of date of updation of invoice on the portal. The inputs from DISCOMs should be brief and precise and to not exceed 150 words, for which the portal would have necessary checks.

VIII. Discoms shall be responsible for updation of payment details against the Invoices updated by the suppliers and information of payment available on the portal at 17:30 on the day just before the default trigger date shall be considered for regulation of access to power as per the rules, where ever applicable.

F.No.10/03/2022-UR&SI-II-Part (4) (E-264599)
Government of India
Ministry of Power
Shram Shakti Bhavan, Rafi Marg,New Delhi
******

Dated: 26th August, 2022

To

1. **ACS / Principal Secretaries / Secretaries (Energy/Power) of All States/UTs**
2. **CMDs and MDs of all DISCOMs**
3. **MDs of all IPPs**
4. **CMDs of NTPC, NHPC, DVC, SJVN, BBMB, THDC and NEEPCO**
5. **CMD, PFC**
6. **CMD, REC**

Sub. : Implementation of the "Electricity (Late Payment Surcharge & related matters) Rules, 2022

Sir/Madam(s),

The LPS Rules 2022 provides for regulation of access to power in case of non-payment of dues, one month after the due date of payment or two and half months after the presentation of bill by the generating company, electricity trading licensee or the transmission licensee, as the case may be, whichever is later. As such, a period of 2.5 months is adequate enough to settle the regular bills by the distribution licensees. The over dues of prior period i.e. up to 3rd June 2022 are being liquidated through EMIs as per the Rules for which financial assistance is also available from REC/PFC/FIs/Banks.

2. Ministry of Power has already circulated the broad framework for implementation of the Rules vide letter F.No. 09/01/2021-UR&SI-II-Part(1)-(E-256003) dated 11th August 2022 **(copy enclosed)** and PFC has been designated as the Nodal Agency for implementation of Rules. Operationalization of rules is being done through an automated process using existing PRAAPTI Portal and POSOCO Portal by on boarding DISCOMs on the Portal.

3. In order to streamline the process of monitoring of payments of regular bills of suppliers by the DISCOMs and identifying defaults by the DISCOMs in payment of dues and consequent regulation of access to power as per the Rules, the following SOP is prescribed:

I. Suppliers (CPSEs/IPPs/REs/CTU) must update the details of invoices presented to DISCOMs on the PRAAPTI Portal within 5 days (including any holidays) of date of Invoice (DOI). The date of presentation of bill (DOP) to DISCOMs shall also be entered by the Generator on the portal, which shall form the anchor date in respect to determination of due date and default trigger date on the portal in line with provisions of the ibid rules.

II. The portal will auto check this period of 5 days and suppliers shall not be allowed to update details of Invoices beyond this period in any case.

III. An automated email would be sent to designated Email-ID of DISCOMs upon entry of any new invoice on the portal along with basic details of invoice including bill amount, bill due date and default trigger date.

IV. The default trigger date shall be generated by the Portal as per the Rules on the basis of due date and date of presentation of bill.

contd...

V. For the purpose of implementation of Rules, the dues would be considered as per Invoices updated by the suppliers on the portal which are not stayed by a competent court or Tribunal or dispute resolution agency as designated in the Power Purchase Agreement.

VI. DISCOMs may provide their inputs regarding prima facie incompleteness, if any, against the Invoices updated by the Suppliers on the Portal with the approval of Competent Authority of DISCOMs (not lower than the Director level of DISCOM) within 10 days (including any Holidays) of date of updation of invoice on the portal. The inputs from DISCOMs should be brief and precise and to not exceed 150 words, for which the portal would have necessary checks.

In such cases, an automated email would be sent to designated Email-ID of Supplier with details of inputs provided by the DISCOMs.

In case, no inputs are provided by the DISCOMs within the above stipulated period, the details of invoices would be automatically frozen.

VII. If required, the supplier would update the details of concerned Invoice within 10 days of inputs provided by the DISCOMs. An automated email would be sent to designated Email-ID of DISCOMs upon updation of invoice. After this period of 10 days, details of invoices would be automatically frozen on the Portal for all purposes.

As such, details of the invoices would be frozen within maximum period of 25 days from the date of Invoice in all cases.

VIII. Discoms shall be responsible for updation of payment details against the Invoices updated by the suppliers and information of payment available on the portal at 17:30 on the day just before the default trigger date shall be considered for regulation of access to power as per the rules, where ever applicable.

IX. Payment status should be updated by Discoms on Portal in following manner :

a. Discom has to certify that the invoice amount has been settled in full (payment amount may be different on account of various deductions inter-alia TDS, advance settlement, penalty, rebates etc.).

b. Discom has to input details of payments (UTR no., cheque no., date of payment etc.).

c. An automated email will be sent to Supplier on payment updation by Discom.

Encl: As above

26/08/2022

(Jamiruddin Ansari)
Deputy Secretary to the Govt. of India
Tel: 011-23352913

Copy to:

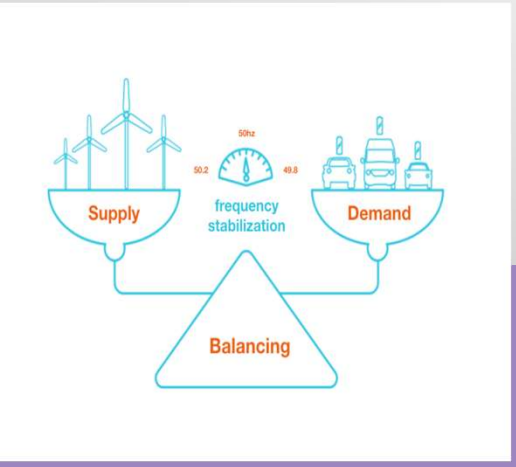
1. Chief Executive, IBA : For information of all Banks
2. Association of Power Producers : For information to all Generating company members
3. National Solar Energy Federation of India : For information of all Members
4. Indian Solar Manufacturers Association (ISMA) : For information of all Members
5. All India Solar Industries Association (AISIA) : For information of all Members
6. North India Module Manufacturers Association (NIMMA) : For information of all Members
7. Indian Electrical and Electronics manufacturers Association: For information of all Members
8. National Solar Energy Federation of India: For information of all Members
9. Solar Power Developers Association: For information of all Members

10. Distributed Solar Power Association (DiSPA) : For information of all Members
11. Indian Wind Power Association (IWPA) : For information of all Members
12. Indian Wind Energy Association (InWEA) : For information of all Members
13. Indian Wind Turbine Manufacturers Association (IWTMA) : For information of all Members
14. Wind Independent Power Producers' Association(WIPPA) : For information of all Members

Copy also to:

1. Sr. PPS to Secretary (Power)
2. PPS to JS(R&R)
3. PPS to JS(D)

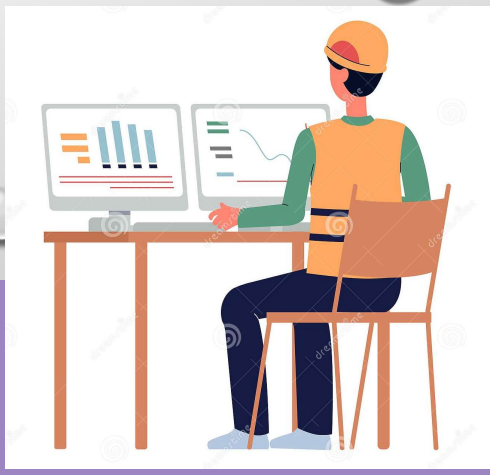
DRAFT INDIAN ELECTRICITY GRID CODE (IEGC) 2022



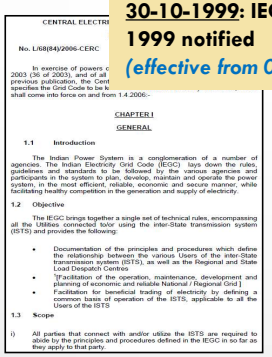
SOURAV MANDAL

MANAGER (SYSTEM OPERATION)

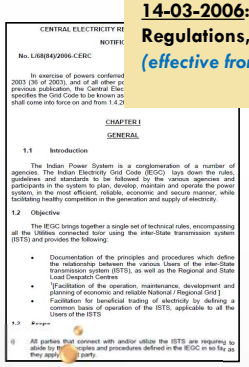
POWER SYSTEM OPERATION CORPORATION LTD
(A Government of India Enterprise)
NORTH EASTERN REGIONAL LOAD DESPATCH CENTRE, Shillong – 793006



Indian Electricity Grid Code – Progress so far



30-10-1999: IEGC Regulations, 1999 notified
(effective from 01-02-2000)



14-03-2006: IEGC Regulations, 2006 notified
(effective from 01-04-2006)

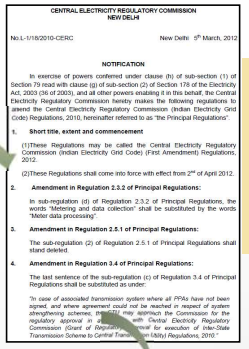
Undergone several amendments till 2009

Substituted the IEGC Regulations 2006

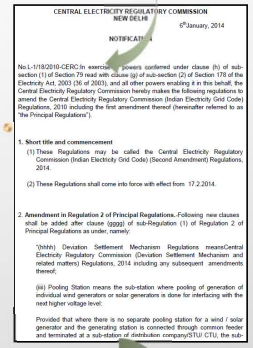
28-04-2010: CERC (IEGC) Regulations, 2010 gazetted
(effective from 03-05-2010)

Followed by:
Corrigendum dated 03-07-2010
Addendum dated 03-07-2010

01st Amendment of IEGC by CERC



05-03-2012: CERC (IEGC, 1st Amendment) Regulations, 2012 notified
06-03-2012: CERC (IEGC, 1st Amendment) Regulations, 2012 gazetted
(effective from 02-04-2012)

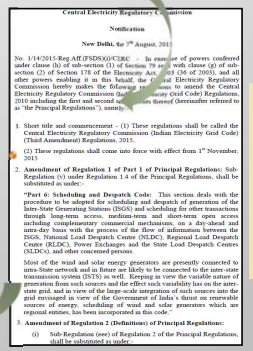


06-01-2014: CERC (IEGC, 2nd Amendment) Regulations, 2014 notified
07-01-2014: CERC (IEGC, 2nd Amendment) Regulations, 2014 gazetted
(effective from 17-12-2014)

Followed by:
Corrigendum dated 21-02-2014

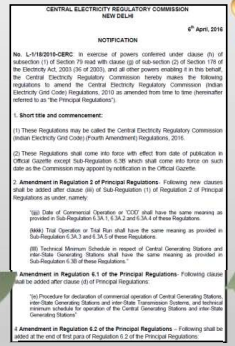
02nd Amendment of IEGC by CERC

03rd Amendment of IEGC by CERC



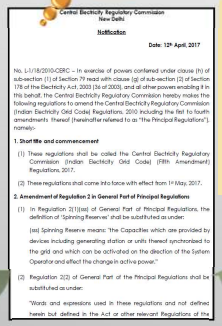
07-08-2015: CERC (IEGC, 3rd Amendment) Regulations, 2015 notified
10-08-2015: CERC (IEGC, 3rd Amendment) Regulations, 2015 gazetted
(effective from 01-05-2015)

06-04-2016: CERC (IEGC, 4th Amendment) Regulations, 2016 notified
29-04-2016: CERC (IEGC, 4th Amendment) Regulations, 2016 gazetted
(effective from 29-04-2016)



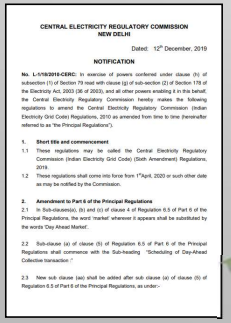
12-04-2017: CERC (IEGC, 5th Amendment) Regulations, 2017 notified
19-04-2017: CERC (IEGC, 5th Amendment) Regulations, 2017 gazetted
(effective from 01-05-2017)

Followed by:
Corrigendum dated 03-05-2017



05th Amendment of IEGC by CERC

06th Amendment of IEGC by CERC



12-12-2019: CERC (IEGC, 6th Amendment) Regulations, 2019 notified
12-12-2019: CERC (IEGC, 6th Amendment) Regulations, 2019 gazetted
(effective from 01-06-2020)

Followed by:
Corrigendum dated 17-05-2020

DRAFT IEGC 2022 : STRUCTURE

Existing IEGC 2010	Draft IEGC 2022
1. General 2. Role of various organizations and their linkages 3. Planning code for inter-state transmission 4. Connection code 5. Operating code 6. Scheduling and despatch code 7. Miscellaneous	1. Preliminary 2. Resource planning code 3. Connection code 4. Protection code 5. Commissioning and commercial operation code 6. Operating code 7. Scheduling and Despatch code 8. Cyber security 9. Monitoring and compliance code 10. Miscellaneous

CHAPTER 1

PRELIMINARY

CHAPTER 2

RESOURCE PLANNING CODE

RESOURCE PLANNING CODE

- NEW CHAPTER ADDED
- COVERS THE INTEGRATED RESOURCE PLANNING INCLUDING
  - DEMAND FORECASTING,
  - GENERATION RESOURCE ADEQUACY PLANNING AND
  - TRANSMISSION RESOURCE ADEQUACY ASSESSMENT, REQUIRED FOR SECURE GRID OPERATION.

Demand Forecasting

Each distribution licensee within a State – To estimate demand in its control area for the next five (5) years starting from 1st April of the next year – Submit to STU by 31st July

STU – To estimate the demand for the entire State for the next five (5) years – By 30th August

FOR may develop guidelines for achieving consistency and statistical accuracy by taking into consideration: economic parameters, historical data and sensitivity and probability analysis

- **Transmission resource adequacy assessment**
  - Assessment and planning of ISTS – CTU
  - Assessment and planning of Intra-STS - STU

Generation Resource Adequacy Planning

existing and additional generation resources based on estimated demand and prepare its procurement plan to ensure adequacy of gen resources and Planning reserve margin (PRM)

existing generation resources assessment and any other details for carrying out a national level simulation for generation resource adequacy for States – By 30th Sept

NLDC – To carry out simulation studies for assisting states in making optimal RA plan. It will be merely an aid for distribution licensees, all commercial decisions reg. procurement will be of the distribution licensees

- Each distribution licensee shall ensure demonstrable generation resource adequacy as specified by the respective SERC for the next five (5) years. Failure to meet target approved by the SERC: liable for payment of resource adequacy noncompliance charge as may be specified by the respective SERC
- FOR to develop model regulation for assessment, procurement planning, compliance etc.

CHAPTER 3

CONNECTION CODE

Key Highlights

- Connectivity, procedure and requirements for physical connection and integration of grid element.
- Connectivity to the ISTS shall be granted by CTU.
- After grant of connectivity and prior to the trial run for declaration of commercial operation, the tests as specified under this Code shall be performed.
- Detailed NLDC first time charging procedure for energization and integration of new or modified power system element. SLDC procedure for intra-state elements
- Connectivity agreements: Users under GNA to sign with CTU and ISTS transmission licensees to sign with CTU
- Joint study by CTU/NLDC or RLDC six (6) months before the expected date of first energization.
- Reliable speech and data communication systems shall be with NLDC, RLDC and SLDC

CHAPTER 4

PROTECTION CODE

Key Highlights

- Uniform protection protocol for the users of the grid
- All users shall provide and maintain main and backup protection. RPC to develop/review/revise the protection protocol in consultation with the stakeholders in the concerned region.
- All users shall ensure correct settings as specified by RPC, ensure proper coordinated settings, furnish protection settings to RPC, obtain approval of RPC for any revision of settings and intimate to RPC about changes implemented within a Fortnight
- RPC shall maintain centralized database of 220kV and above elements, review protection settings at least once in a year, carry out necessary studies for protection coordination twice a year.
- Protection Audit: Users to conduct annual internal protection audit and third party audit once in 5 years . Submit reports to RPC with action plan. Annual submission of audit plan by 31st Oct. RPC to approach commission for non-compliance of protection protocol or failure to undertake remedial action within specified timeline.

PROTECTION CODE : SYSTEM PROTECTION SCHEME (SPS) & RECORDING INSTRUMENTS

- SPS TO HAVE REDUNDANCIES IN MEASUREMENT OF INPUT SIGNALS AND COMMUNICATION PATHS INVOLVED UP TO THE LAST MILE
- USERS/SLDCS TO REPORT **SPS OPERATION WITHIN THREE DAYS OF OPERATION** TO RPC/RLDC IN FORMAT
- RPCS TO PERFORM **REGULAR DYNAMIC STUDIES AND MOCK TESTING (AT LEAST ONCE IN A YEAR) OF SPS**
- USERS SHALL KEEP THE RECORDING INSTRUMENTS (DISTURBANCE RECORDER AND EVENT LOGGER) IN PROPER WORKING CONDITION.
- DISTURBANCE RECORDERS TO HAVE TIME SYNCHRONIZATION AND A **STANDARD FORMAT FOR RECORDING ANALOGUE AND DIGITAL SIGNALS** WHICH SHALL BE INCLUDED IN THE GUIDELINES ISSUED BY THE RESPECTIVE RPCS.

SPS Redundancy | **SPS study and Mock test plan** | **DR Standardization**

CHAPTER 5

COMMISSIONING AND COMMERCIAL OPERATION CODE

Key Highlights

- Drawl of startup power before COD: 15 months prior to first synchronization and 6 months after the date of first synchronization.
- Injection of infirm power shall not exceed 6 months from the date of first synchronization
- Start-up power shall not be used by the generating station for the construction activities
- Trial run: 7 days ahead notice. In case of repeat trial run within 24 hrs, fresh notice not required.
- Trial run period: Thermal – 72 hrs (4hrs interruption allowed), Hydro – 12 hrs (No interruption allowed), Solar – sunrise to sunset in a single day, Wind -4 hrs, ESS - 1 cycle of charging and discharging of energy, PSP- is 1 cycle of turbogenerator and pumping motor mode, Transmission- 24 hrs

CHAPTER 6

OPERATION CODE

KEY HIGHLIGHTS

- This Chapter deals with the OPERATING PHILOSOPHY to be followed by all grid connected entities to ensure stability and resilience.
- PSS, AVRs and reactive power controllers shall be properly tuned by the generating station as per the procedure prepared by the concerned RPC. Failing to complete the tuning within a specified time, may lead to disconnection of unit by RLDC on receipt of intimation from RPC
- The islanding schemes shall be reviewed and augmented at least once in 3 (three) years. Mock drill shall be carried out annually by the respective RLDCs in coordination with the concerned SLDCs and other concerned users.
- The National Reference Frequency shall be 50.000 Hz and the allowable band is 49.95-50.05 Hz.
- Primary, Secondary and Tertiary reserves shall be deployed for the purpose of frequency control, reducing area control error and relieving congestion.
- NLDC shall reschedule generation including curtailment of wind, solar and wind-solar hybrid generation, if required, in coordination with the respective RLDCs and SLDCs to maintain the minimum inertia.
- Any entity extending black start support shall be paid for actual injection @ 110 % of normal rate of charges for deviation in accordance with DSM Regulations for the last block in which the grid was available.
- For the purpose of analysis and reporting, telemetered data shall be archived with granularity of not more than five (5) minutes and higher granularity for special events. Such data shall be stored by SLDCs, RLDCs and NLDC for at least fifteen (15) years and reports shall be stored for twenty-five (25) years for operational analysis
- A monthly report on events of unintended operation or non-operation of protection system shall be prepared and submitted by each user to concerned RPC and RLDC within the first week of the subsequent month

CHAPTER 7

SCHEDULING AND DESPATCH CODE

KEY HIGHLIGHTS

- INTRODUCTION OF GNA, T-GNA, SCUC & SCED(PRESENTLY PILOT).
- CHANGES IN CRITERIA OF SCHEDULING RESPONSIBILITY OF RLDC AND SLDC
- DC DECLARATION NOW MANDATORY FOR ALL REGIONAL GENERATING STATION(INCLUDING IPP) ON DAY AHEAD.
- RLDC SHALL ASK EACH REGIONAL GENERATING STATION TO DEMONSTRATE THE DC (AT LEAST ONCE IN YEAR)
- GENERATING STATION MAY SELL ITS REQUISITION SURPLUS (URS) AS AVAILABLE IN DAM (WITHOUT BENEFICIARIES' CONSENT)
- 110% OVERLOADING PERMITTED FOR HYDRO GENERATOR IN CASE OF SPILLAGE
- ONLY RE GENERATORS SHALL BE EXCLUDED FROM MERIT ORDER DESPATCH. RE, RE-HYBRID & RUN OF RIVER HYDRO PLANT WITH UPTO 3 HRS PONDAGE GET PRIMARY INSULATION IN CASE OF CURTAILMENT
- MENTION OF MANDATORY RAMP RATE FOR GENERATORS
  - COAL OR LIGNITE FIRED PLANTS:1 %
  - GAS POWER PLANTS :3%
  - HYDRO POWER PLANTS: 10%

Time-Line	Present	Activities	Responsible Agency
by 6 AM on 'D-1' day	By 6 AM	Declaration of Declared Capacity by generating stations	Generating Station, QCA
7 AM on 'D-1' day	By 8 AM	Entitlement of each beneficiary or buyer	RLDC
8 AM on 'D-1' day	By 3 PM	Requisition of schedule by buyers who are GNA grantees	SLDC, Regional entities
9 AM on 'D-1' day	By 6 PM	Allocation of corridors by RLDC for GNA grantees: • In case of constraint in transmission system, available transmission corridor against the GNA shall be intimated to drawee GNA grantees by **8.15 AM.** • GNA grantees shall revise their requisition **by 8.30 AM** • RLDC shall issue final drawl schedules for GNA grantees **by 9 AM**	RLDC
9 AM on 'D-1' day		Requisition of schedule by T-GNA grantees	SLDC, Regional entities
9:30 AM on 'D-1' day		After allocating corridors to GNA grantees, RLDC shall issue final drawl schedules for T-GNA grantees. & release the balance corridors for DAM (Collective)	RLDC

Time-Line	Present	Activities	Responsible Agency
10 AM to 11.30 AM of 'D-1'	10 AM to 12 AM	Power Exchange(s) shall open bidding window for day ahead collective transactions	Generating Station, QCA
12.00 Noon of D-1	1 PM	PX(s) shall submit the day-ahead provisional trade schedules to NLDC	PX(s)
12.30 PM of 'D-1'	2 PM	NLDC shall validate the same from system security angle and inform the power exchange with revisions required, if any, due to transmission congestion	NLDC
1.00 PM of 'D-1	3 PM(NLDC)/ 6 PM (RLDC)	PX(s) shall submit the final trade schedules to NLDC for regional entities and to SLDC for intra-State entities. RLDC shall release balance corridors after finalisation of schedules under DAM (Collective)	PX(s), RLDC
2.00 PM of 'D-1	6 PM	RLDC shall process exigency applications received till 1 PM of 'D-1' day for the 'D' day and update the availability of balance transmission corridors on its website.	RLDC
		The balance transmission corridor may be utilised by GNA grantees by way of revision of schedule under any contract within its GNA or for exigency applications or in real time market on first cum first serve basis.	

PROCESS TO UNDERTAKE SCUC ON DAY AHEAD

Time-Line	Activities	Responsible Agency
By 1330 Hrs. (D-1day)	**NLDC publish** a tentative list of generating **stations or units** thereof, which are likely to be scheduled below the minimum turn down level, based on beneficiary requisitions and **initial unconstrained bid results of DAM** in power exchanges, **received till 1300 Hrs of the D-1 day.**	NLDC in coordination with RLDCs
By 1630 Hrs. (D-1day)	**Beneficiaries** of such stations shall be permitted to **revise their requisitions** from such stations **by 1630 Hrs of D-1 day,**shall be **final and binding after 1630 Hrs of D-1 day** and further reduction in drawal schedule shall not be allowed from such stations for such time blocks	Beneficiaries
After 1630 Hrs (D-1day)	NLDC prepare the final list of such generating units that are likely to go below their minimum turndown level & stacked generating units as per merit order. generating units so identified shall be **considered for undertaking SCUC**	NLDC in coordination with RLDCs
by 1800 Hrs (D-1day)	If the NLDC in coordination with RLDCs **anticipates shortfall of reserves** in D day, NLDC may **schedule incremental energy** from the generating units by 1800 Hrs. of D-1 day and update the list on the respective RLDC website- By reducing generation from On-bar generations by the order of highest to lowest VC	NLDC in coordination with RLDCs
	generating stations or units not brought on bar under SCUC, shall have the option to **operate at a level below the minimum turn down** level or to go under **Unit Shut Down (USD).**	

OBLIGATION TO SUPPLY ELECTRICITY-USD

- IN CASE A GENERATING STATION, OR UNIT THEREOF, OPTS TO GO UNDER UNIT SHUT DOWN (USD), THE GENERATING COMPANY OWNING SUCH GENERATING STATION OR UNIT THEREOF SHALL FULFIL ITS **OBLIGATION TO SUPPLY ELECTRICITY TO ITS BENEFICIARIES WHO HAD MADE REQUISITION FROM THE SAID GENERATING STATION PRIOR TO IT GOING UNDER USD,** BY ENTERING INTO A CONTRACT(S) COVERED UNDER THE POWER MARKET REGULATION OR BY ARRANGING SUPPLY FROM ANY OTHER GENERATING STATION OR UNIT THEREOF OWNED BY SUCH GENERATING COMPANY SUBJECT TO HONORING OF RIGHTS OF THE ORIGINAL BENEFICIARIES OF THE SAID GENERATING STATION OR UNIT THEREOF FROM WHICH SUPPLY IS ARRANGED.

REVISION OF SCHEDULE

- REVISION OF SCHEDULES ON REQUEST OF REGIONAL ENTITIES:
  - REVISION ONLY ALLOWED IN SCHEDULE UNDER GNA. NO REVISION ALLOWED FOR SCHEDULE UNDER T-GNA
  - AFTER 2PM ON D-1, ONLY UPWARD REVISION IS ALLOWED FOR SEC 62 GENERATORS
- CURTAILMENT OF SCHEDULED TRANSACTIONS FOR GRID SECURITY BY RLDC
  1. BILATERAL TRANSACTIONS UNDER T-GNA(OTHER THAN RE)
  2. BILATERAL TRANSACTIONS UNDER T-GNA(RE)
  3. COLLECTIVE TRANSACTIONS UNDER DAY AHEAD MARKET
  4. COLLECTIVE TRANSACTIONS UNDER REAL TIME MARKET
  5. TRANSACTIONS UNDER GNA(OTHER THAN RE)
  6. TRANSACTIONS UNDER GNA (RE)
- REDUCTION IN GENERATION BY RLDC IN THE EVENT OF BOTTLENECK
  - GENERATION AND DRAWL SCHEDULES REVISED BY THE RLDC SHALL BECOME EFFECTIVE FROM 7TH BLOCK OR 8TH BLOCK
- SCHEDULE REVISION IN CASE OF GD-5
  - SCHEDULE REVISED EQUAL TO ACTUAL FOR ALL AFFECTED TIME BLOCKS
  - SCHEDULE OF ONLY BENEFICIARIES OF AFFECTED BY GD SHALL BE REVISED

CHAPTER 8

CYBER SECURITY

Key Highlights

- This chapter deals with measures to be taken to safeguard the national grid from spyware, malware, cyber-attacks, network hacking.
- All users shall conduct Cyber Security Audit as per the guidelines mentioned in the CEA (Cyber Security in Power Sector) Guidelines, 2021 and any other guidelines issued by an appropriate Authority.
- All entities shall immediately report instance of cyber-attack to the appropriate government agencies, NLDC, RLDCs, SLDCs, RPCs and the Commission

Chapter 9

Monitoring and Compliance Code

Key Highlights

- This chapter deals with monitoring of compliance, reporting of violations and initiating appropriate action.
- All users, CTU, STUs, NLDC, RLDCs, RPCs and SLDCs shall conduct annual self-audits to review compliance of these regulations and submit the reports by 31st July of every year.
- The Commission may order independent third-party compliance audit for any user, CTU, NLDC, RLDC and RPC as deemed necessary.

Thank You

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souravmandal@posoco.in

DRAFT AMENDMENTS IN TCT REGULATION 2019

Amendments vis a vis original regulation

Category	Original regulation	Draft amendments
Deemed Available (DA)	Shifting of TL for projects of NHAI, Railways and BRO **not covered**	Outage due to such shifting to be considered DA provided- a) DICs are not affected b) MS, RPC may restrict the DA period to that considered reasonable
Force Majeure/ GD event	A reasonable restoration time shall be considered by the MS RPC, with **no specified time limit**	Time limit (T) introduced as follows- a) T < 1 month - MS NERPC b) 1 < T< 3 months – RPC c) T > 3months – CERC

National level optimization of Surplus generation capacity

(A) Background

1. The generation capacity in the country are mainly categorized as under:
   (i) State owned generating capacity
   (ii) Central Generating Stations
   (iii) Private Sector: IPPs
   (iv) Captive generating Stations

2. The generating capacities are not being optimally utilized on many occasions. Every year we observe difficulty in meeting the demand and some states do resort to power cuts. Especially during the April, May, September and October months the crisis is observed. The capacity is available in the country but due to one to one agreement constraint, the generating capacity even though available cannot be utilized by the entity who due to some reason or the other is facing crisis.
3. The Distribution licensees tie up power from above generating sources mainly under following routes:
   (i) At regulated tariff determined by the Appropriate Commission under section 62 of the EA 2003.
   (ii) At bid tariff adopted by the Appropriate Commission under section 63 of the EA 2003.
   (iii) Banking of Power

4. State owned generating companies supply power to Distribution companies of the same State and also supply seasonal surpluses to some other states under banking arrangements among such distribution companies.
5. Central Generating companies supply power to the States under the allocation made by the Central Government. There are some power which have been surrendered by the States are also reallocated to the other needy States. Some States have exited from the PPA after completion of 25 years, and such power is available for merchant sale as well.
6. The allocation of power is generally done to the states within the regions. There are five regions in the country ie Eastern, Western, Southern, Northern and North Eastern regions. Accordingly, the scheduling is also done among the beneficiaries of the region or the Power Purchase Agreement (PPA) holders from such power plant. In case there is Un-requisitioned Surplus (URS) power within the region, it is available to only the original beneficiary of that power plant which means such URS power remains concentrated in the respective region only. There are following concerns:

   (i) Generally there are similar demand pattern in the region and hence if demand is low, then some of the generating stations in the merit order despatch has surplus capacity as they are not scheduled. As a result, most

of the time, due to overall requisition being less than technical minimum (TM), the plant(s) donot generate and go under Reserve Shut Down (RSD). There are two consequences of this:

a. The plant is out of bar and is not available in the grid. Hence they cannot serve the grid under any contingencies or be used for Ancillary Services (Reserves).
b. Even the states who has power allocation and need power from such plant are deprived of the generation, as due to not attaining the TM, the plant is not generating and remains under reserve shutdown.

(ii) The demand in some other region may be high or the states who donot have the allocation from such power plants may be needing the power due to increased demand. Eg. Peak in Northern region is during summerwhereas Peak in Southern region is during winter. Similarly there is diversity in the time at which the peak occurs in the States.

7. At present, to facilitate use of surplus power by the constituents of the region, a portal is operational in Western Region (WR) and Eastern Region (ER). In order to have national level optimization, it is being proposed to have a national level mechanism and portal so that any state/ discom can use the surplus power from central generating stations of any region.

8. Private Sector: IPPs
Besides PPA holders, they may sell their surplus power in the power exchanges or sell in Term Ahead Market (TAM) or Day Ahead Market (DAM) or Real Time Market (RTM) or through DEEP e-portal.

9. Captive generating Stations
They can sell their surplus power after meeting their own requirement.

(B) Proposed Scheme

1. For Central Generating Station (CGS).
   a. Flexibility to use of URS power (Day ahead basis) by all constituents in the country and ;
   b. Use of longer duration surplus power.
2. For Inter- State Generating Stations (ISGS) (excluding CGS)
3. For Surplus power with the States/ Distribution companies (whether State owned or Private)

<u>The above proposal can be implemented in phases:</u>

Phase -1 : for CGS – within 3 months
Phase -2 : For ISGS (excluding CGS) – within 6 months

Phase -3 : For Surplus power with the States/ Distribution companies (whether State owned or Private) by other States/ Distribution companies– within 6 months

1.1 Phase 1: Standard operating Procedure (SOP) for flexibility to use the URS power of CGS by all the States/ Discoms irrespective of the original beneficiary/ beneficiary of the region

1. The original beneficiaries of CGS shall submit through web-based energy scheduling portal the surrendered quantum/URS (MW), duration (block-wise) and tariff (determined by the Appropriate Commission). However, the tariff will be subject to any changes made by the Appropriate Commission.

   In case of URS offer is for longer duration, the original beneficiaries may also provide a standing consent to the CGS specifying quantum and time period.

2. The willing new beneficiaries shall submit its requisition for availing URS power through web-based energy scheduling portal. The quantum and time period shall be specified and acceptance to pay the tariff as determined by the Appropriate Commission.

3. CGS shall be permitted to revise its schedule for URS power from its original beneficiary to any other beneficiary. The new beneficiary shall be liable to pay both variable charge (VC) and fixed cost (FC) for full requisition and original beneficiaries shall have no right to recall as entire FC liability is shifted to the new buyer.

4. The payment shall be secured through suitable payment security mechanism e.g. letter of credit (LC) or advance payment or any other mutually agreed payment security mechanism.

5. Consent and details of surrender and requisition of URS power of the original beneficiaries and the new beneficiaries shall be submitted by CGS to the National Power Committee (NPC) through portal.

6. NPC shall provisionally allocate URS power on portal to willing new beneficiaries based on following criteria:

   i. First preference shall be given to co-beneficiaries of the CGS.

   ii. In case multiple beneficiaries seek to avail URS power from a CGS, the URS power allocation will be on first come first serve basis.

iii. In case, multiple beneficiaries request simultaneously (in the same time block) and the sum of their requisitioned power exceeds the available URS power, then the URS shall be apportioned & scheduled prorata in the ratio of the respective requisitions (in MW) made by the buyers.

7. NPC shall communicate through portal the provisional allocation of URS power to the CGS, respective RLDCs and NLDC and the beneficiary to whom the power is temporarily allocated.

8. NLDC shall finalize on the portal the allocation of URS power after checking availability of margins in the transmission network, and communicate to ISGS, respective RLDCs and NPC.

9. The concerned RLDC shall schedule the URS power as per the requisition within the time blocks stipulated in IEGC.
10. Payment settlement will be as per the REAs (Regional Energy Accounts) prepared by the concerned RPCs. This will be binding on all the buyers of power from CGS.
11. The procedure of temporary allocation of power from CGS can be further simplified as under:

i. Temporary allocation of 1 to 15 and 16 to end of month shall be done by CEA with the following time lines:

Time Line	Beneficiaries actions	Advantage
D-15 to D-13 day	Surplus beneficiaries would upload the surrender information in portal	The buyer/purchaser would be assured of its power. The seller will be relieved of FC.
D-12 to D-10	Requisitioning Beneficiaries will show their interest	
Request received upto 24 hrs of D-10 would be frozen		
D-9 to D-8	PSM by beneficiaries and confirmation by the generating stations	
D-7 to D-5	CEA would compute the temporary allocation.	
D-4	CEA would be issue the temporary allocation which would be implemented in WBES of RLDC.	

Note: For 1st October to 15th October window for surrender will open during from 16th September to 18th September. Requisitioning window will open from 19th September to 21st September and on 27th September CEA will bring out temporary allocation.

ii. Generally to facilitate revival of units under Shut Down (Max around 36 hrs for cold start) or to avoid units to for RSD, on every D-2, RLDC would take the surrender and purchase request received upto 24 hrs of D-3 for the ISGS it is scheduling and compute share allocation which will be used for creating Entitlement, scheduling and part load compensation for complete D day (00-24 hrs). The requisition can be beyond the MoP allocation. The same would be published by RLDC on its website by 18 hrs on D-2 day. This would address short term requirement on assured power/surrender on D-2.

iii. If any unit goes on RSD, respective RLDC would create on bar entitlement based on requisitions which will be used for creating On bar Entitlement, scheduling and for computing part load compensation. Requisitions can be beyond MoP allocation. This would be computed by RLDC for each day on rolling basis.
Off bar Entitlement will be created based on surrender request.
This will ensure power to needy states and not only FC liability for units going under RSD. Small states will get their share from On Bar units. Part Load compensation will be paid only on whose name Entitlement is created.

1.2 Phase 2: Standard operating Procedure (SOP) for flexibility to use the URS power of ISGS (other than CGS) by all the States/ Discoms irrespective of the original beneficiaries of the region

Similar procedure may be adopted for such plants as well.
In case of these power stations, as there is no allocations made by the Central Government, the proposal concerning allocation, as stated in para 1.1, may not be applicable. Rest of proposal may be adopted. If both the buyers and the seller agree and give consent, the surplus power from such stations can also be used by other buyers. In such cases the new buyer will pay the full fixed cost and the variable charges.

1.3 Phase -3 : Standard operating Procedure (SOP) for flexibility to use the Surplus power with the States/ Distribution companies (whether State owned or Private) **by the other States/ Discoms**

i) At present some of the distribution companies are giving the surplus power to some other states through the banking process and take back the power when they need it as per the mutual agreement.

ii) It is also observed that due to the diverse nature of demand in different states at different time, there is a possibility of optimum utilization of resources.

iii) Many times it is seen that the States which are surplus during some period of time are keeping their own generating stations under reserve Shutdown. But there are other states which are facing crisis. But in the absence of any mechanism, the resources even though available in the country but is not used to meet the overall demand in the country and there are load shedding. In the mutual interest, the mechanism needs to be established which helps the needy states. The State generating companies can also improve their plant load Factor and the effective overall per unit cost of generation of such generating companies can also be reduced.

iv) An exercise was carried out by the RPCs to know the states which are having surplus power and its duration. The states who can utilize such power were also identified. There are complementarity of demand. This can also vary depending upon the actual case even for a smaller duration depending upon the weather condition.

v) However, this cannot be one time exercise, the best use can be if there is an online mechanism where in states can temporarily transact.

vi) There may be an argument that the states can go and sell power in the power exchanges. But the experience shows that the states prefer to keep their units under reserve shutdown. Further, the states / state owned generating companies do not take risk to bring their units mainly due to uncertainty of the Market clearing price.

vii) Thus, if the tariff is assured by some other states, the generating stations will come on bar and generate power. This will also reduce the burden of fixed cost to the Discoms and the retail tariff will also reduce benefitting the consumers. The buying State/ discoms shall also bear the transmission charges as applicable.

viii) In view of the above following is proposed :

a. Banking arrangements may continue as at present
b. Even for shorter duration, states may trade at the tariff determined by the Appropriate Commission. State generating companies will also become viable as their PLF will increase. Thus reducing the per unit cost of power to even the existing buyers/ distribution companies.

(C) The summary proposed timelines for implementation to prepare to avert future power crisis at the earliest.

a. The presentweb based energy scheduling online portal to be upgraded by NTPC at the national level in 2 months
b. POSOCO to link it with the scheduling module.
c. The phase –I for CGS to be completed by 30th November 2022.
d. States to give their comments in 20 days. Their suggestions to be incorporated by 15th October 2022.
e. The phase – II and Phase – III to be completed by February 2023.

f. This will ensure capacity availability for all the States/ Discomsespecially during the April, May, September and October months when the crisis is observed.

Annex 2.3

State	Month	Jan	Jan	Feb	Feb	Mar	Mar	Apr	Apr	May	May	Jun	Jun	Jul
	Hrs	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.
Assam	Surplus	100-500		100-500		100-500								
Assam	Deficit							600-700*	600-700*	600-700*	600-700*	600-700*	600-700*	600-700*
Meghalaya	Surplus									120	120	120	120	120
Meghalaya	Deficit	100	100	100	100	100	100							
Manipur	Surplus											55^	55^	55^
Manipur	Deficit	40	40	40	40									
Tripura	Surplus													
Tripura	Deficit	√	√	√	√	√	√	√	√	√	√	√	√	√
Arunachal	Surplus											65	65	65
Arunachal	Deficit	30	30	30	30	30								
Nagaland	Surplus									30	30	30	30	30
Nagaland	Deficit	40	40	40	40	40	40							
Mizoram	Surplus													40
Mizoram	Deficit	peak	peak	peak	peak	peak	peak	peak	peak	peak	peak	peak	peak	

√ quantum to be submitted by states

√/2 mid of month

* peak hours

^ off-peak hours

State	Jul	Aug	Aug	Sep	Sep	Oct	Oct	Nov	Nov	Dec	Dec	Existing Banking
	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	Solar hrs.	Non Solar hrs.	
Assam								100-500		100-500		
Assam	600-700*	600-700*	600-700*	600-700*	600-700*							
Meghalaya	120	120	120	120	120							Haryana, BYPL
Meghalaya								100	100	100	100	
Manipur	55^	55^	55^									BYPL through M/s Kreate
Manipur										40	40	
Tripura												
Tripura	√	√	√	√	√	√	√	√	√	√	√	
Arunachal	65	65	65									Bilateral trade with APPCL
Arunachal										30	30	
Nagaland	30	30	30	√/2(30)	√/2(30)							Goa, Haryana, UP, HP
Nagaland		evening peak	evening peak	evening peak	evening peak					40	40	
Mizoram	40	40	40	40	40	40	40					NIL
Mizoram								peak	peak	peak	peak	

√	√	quantum to be submitted by states
√/2	√/2	mid of month
*	*	peak hours
^	^	off-peak hours

Annex-2.4.1

State	GNA		Total LTA+MTOA	Inside Region (LTA+MTOA)	Outside Region(LTA+MTOA)		Inside region(GNA)	Outside Region (GNA)
	A		B	C	D		E=C/B*A	F=A-E
Chandigarh	342		392	349	43		305	37
Delhi	4,810		5,443	3,324	2,119		2,938	1,872
Haryana	6,913		5,648	3,247	2,401		3,974	2,939
Himachal pradesh	1,130		1,744	1,722	22		1,116	14
Jammu & Kashmir	1,977		2,329	2,099	230		1,782	195
Punjab	5,497		4,660	2,423	2,238		2,858	2,639
Rajasthan	5,755		4,392	2,899	1,493		3,798	1,957
Uttar Pradesh	10,165		13,339	8,677	4,663		6,612	3,553
Uttarakhand	1,402		1,269	1,098	170		1,214	188
Railways-NR-ISTS-UP	130		257	-	257		-	130
PG-HVDC-NR	8		9	9	-		8	-
Chattisgarh	2,149		2,331	2,077	255		1,914	235
Dadra Nagar Haveli	792		1,034	1,031	3		790	2
Daman Diu	334		447	445	2		333	1
Goa	548		643	641	2		546	2
Gujarat	6,434		9,375	7,953	1,422		5,458	976
Madhya Pradesh	7,361		9,053	7,773	1,279		6,321	1,040
Maharashtra	8,496		8,842	7,613	1,229		7,315	1,181
Essar-Steel	563						200	363
PG-HVDC-WR	5		7	7	-		5	-
BARC	5		9	9	-		5	-
Andhra Pradesh	4,516		3,220	3,220	-		4,516	-
Karnataka	4,376		7,380	6,946	434		4,119	257
Kerala	2,679		2,855	1,630	1,225		1,530	1,149
Puducherry	398		513	513	-		398	-
Tamil nadu	9,177		9,016	6,474	2,542		6,590	2,587
Telangana	6,140		4,766	3,302	1,464		4,254	1,886
PG-HVDC-SR	6		8	8	-		6	-
Bihar	5,043		6,624	5,743	881		4,373	670
DVC	956		640	640	-		956	-
Bangladesh	782		782	346	436		346	436
Jharkhand	1,110		1,158	641	517		614	496
Odisha	2,157		2,328	1,578	750		1,462	695
Sikkim	111		93	93	-		111	-
West Bengal	3,946		2,408	2,408	-		3,946	-
PG-HVDC-ER	2		2	2	-		2	-
Arunachal Pradesh	134		288	282	6		131	3
Assam	1,529		1,727	1,331	396		1,178	351
Manipur	204		218	218	-		204	-
Meghalaya	238		256	256	-		238	-
Mizoram	95		137	132	5		92	3
Nagaland	134		194	181	14		125	9
Tripura	311		302	302	-		311	-
PG-HVDC-NER	1		1	1	-		1	-

– Itanagar 132kV D/c line at Gohpur. The LILO along with bays at Gohpur would be implemented by AEGCL.

5.3 GM, POWERGRID said that the existing 132 kV sub-station at Gohpur has single main bus switching arrangement, which can impact reliability of the system. DGM, AEGCL said that to improve reliability, the switching scheme at Gohpur 132 kV S/s would be modified from single main bus to double main bus scheme.

5.4 Chief Engineer, CEA stated that Biswanath Chariali (PG) – Itanagar 132kV D/c line is an ISTS line being implemented as a part of NERSS-II through TBCB and LILO of an ISTS line should preferably be implemented as ISTS work. He requested AEGCL to confirm the availability of space for 2 no. 132 kV bays at Gohpur for the proposed LILO and implementing double main bus switching scheme at Gohpur.

5.5 DGM, AEGCL stated that the availability of space for 2 no. 132 kV bays at Gohpur and implementing double main bus switching scheme at Gohpur would be informed to CEA after the site visit.

5.6 GM, POWERGRID informed that RfP for the scheme NERSS-II Part-B and NERSS-V has been issued in Sep. 2016 and bidders are to be informed about the change in scope before the bid submission date.

5.7 After further discussion, it was decided that the LILO of one circuit of Biswanath Chariali (PG) – Itanagar 132kV D/c at Gohpur (AEGCL) would be implemented through TBCB as ISTS work as a part of NERSS-II Part-B and the scope of works of NERS-II Part-B would be modified accordingly. It was also decided that AEGCL would implement the double main bus switching scheme at Gohpur 132 kV S/S along with 2 no. 132 kV bays at Gohpur before Dec., 2019.

5.8 Subsequently, AEGCL vide its letter no. AEGCI/MD/13th Plan/Tech -593/2014-15/9 dated 30-11-2016 (copy enclosed at Annexure-II) has informed that due to space constraint at Gohpur for accommodating double main bus switching scheme, they have proposed to switch over from AIS to GIS at Gohpur 132 kV S/S along with implementation of 2 no. 132 kV GIS bays for the LILO of one circuit of Biswanath Chariali (PG) – Itanagar 132kV D/c at Gohpur (AEGCL).

6.0 Strengthening of evacuation system of Pare HEP of NEEPCO

6.1 Director, CEA stated that Pare HEP by NEEPCO is expected to be commissioned by Dec., 2016. Evacuation system from Pare HEP consist of

i) LILO of Ranganadi-Naharlagun / Nirjuli 132 kV S/C line at pare HEP

ii) LILO of one circuit of Ranganadi-Itanagar 132 kV D/C line at Pare HEP.

6.2 He added that out of four 132 kV lines evacuating from Pare HEP, two are connected to Ranganadi HEP and remaining two to the load centres viz. Naharlagun and Itanagar. System studies have been carried out for 2018-19 time-frame corresponding to high hydro and low hydro conditions. It is observed that Ranganadi HEP injects power at Pare HEP through Pare – Ranganadi 132kV 2xS/c lines, thereby leaving only 2 no. 132kV S/c lines i.e. Pare – Itanagar and Pare – Naharlagun / Nirjuli for evacuation of 110MW power

from Pare HEP and additional power injected at Pare HEP from Ranganadi HEP. This causes overloading of Pare – Naharlagun / Nirjuli 132kV S/c line (Pare – Naharlagun: 129MW, Naharlagun – Nirjuli: 91MW). In order to overcome this situation, following transmission system modification is proposed to be implemented as NERSS-IX:

(i) Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi - Naharlagun / Nirjuli 132 kV S/C line - ISTS by NEEPCO

(ii) Pare HEP (From LILO point) – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra conductor) – along with 2 no. 132 kV bays at North Lakhimpur ISTS through TBCB

(iii) LILO of one circuit of Pare HEP – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra) at Nirjuli substation – ISTS through TBCB

(iv) Re-conductoring of LILO portion at Pare end (of Ranganadi – Naharlagun / Nirjuli 132kV S/c line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP – by NEEPCO.

6.3 DGM, NEEPCO stated that 132 kV bay equipment at Pare HEP had already been erected.

6.4 Director, CEA stated that to recover additional investment in the transmission and bay equipment modification as suggested above, M/s NEEPCO may file revised tariff petition in CERC. He enquired about the availability of space at North Lakhimpur 132 kV S/S for termination of Pare-North Lakhimpur 132 kV D/C line and at Nirjuli for LILO of one circuit of Pare-North Lakhimpur 132 kV D/C line.

6.5 DGM, AEGCL informed that space for two number 132kV line bays at North Lakhimpur is available. GM, POWRGRID also confirmed the availability of space for 2 no. 132 kV line bays at Nirjuli S/S.

6.6 After further discussion, following additional / modification in the transmission system associated with Pare HEP was agreed as a part of NERSS-IX.

a. Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi - Naharlagun / Nirjuli 132 kV S/C line – ISTS by NEEPCO.

b. Pare HEP (from LILO point) – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra conductor) along with 2 no. 132 kV line bays at North Lakhimpur – ISTS (implementation through TBCB/RTM to be decided by empowered committee).

c. LILO of one circuit of Pare HEP – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra) at Nirjuli substation – ISTS (implementation through TBCB/RTM to be decided by empowered committee).

d. Re-conductoring of LILO portion at Pare end (of Ranganadi – Naharlagun / Nirjuli 132kV S/c line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP – ISTS by NEEPCO

e. 2 no. 132 kV bays at Nirjuli S/S for termination of LILO of one circuit of Pare HEP – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra) – ISTS by POWERGRID.

7.0 Augmentation of 2x30MVA, 220/132kV substation at Mokokchung (PG)

7.1 Director, CEA stated that Mariani (PG)-Mokokchung (PG) 220 kV D/C line supplies power to 2x30 MVA 220/132 kV S/S at Mokokchung (PG) SS, which in turn feeds power to Mokokchung & other downstream areas of Nagaland. Thus, Mokokchung (PG) substation is a vital node for supplying power to Nagaland. He added that under N-1 contingency of ICT at Mokokchung the other ICT would be over loaded and loading has to be restricted to 30 MW. So it was proposed to enhance the transformation capacity at Mokokchung (PG) by installation of third 220/132 kV ICT of 30MVA (3x10MVA) single phase units.

7.2 Director, CEA stated that Mokokchung (PG) belongs to POWERGRID, so augmentation should be done by POWERGRID. The tariff policy in vogue does not exempt implementation of augmentation of sub-station from TBCB. Empowered Committee will take the decision whether the project will be done by POWERGRID or it goes through TBCB.

7.3 GM, POWERGRID informed that the Mokokchung is a GIS station.

7.4 After further discussions, augmentation of 220/132 kV Mokokchung (PG) S/S by 30 MVA (3x10 MVA single phase) was agreed to be implemented as ISTS work with GIS bays as a part of NERSS-VIII. Executing agency for the augmentation would be decided by the Empowered Committee on transmission.

8.0 Conversion of 2 nos. 63 MVAR Line Reactors at Bishwanath Chariali end of Biswanath Chariali – Lower Subansiri 400kV (1st) D/c line to Bus Reactors

8.1 Director, CEA stated that power evacuation system from Lower Subansiri HEP inter-alia, consist of Lower Subansiri - Biswanath Chariali 400 kV 2xD/C lines along with 4x80 MVAR line reactors at Biswanath Chariali. POWERGRID has informed that due to delay in the commissioning of Lower Subansiri HEP, construction of Lower Subansiri - Biswanath Chariali lines have been deferred and the 4 nos. 420kV, 63MVAR line reactors at Biswanath Chariali of the lines are not being used at this moment.

8.2 He added that due to high voltages observed at 400kV level at Biswanath Chariali, Balipara and Ranganadi substations, numbers of 400 kV lines from Bongaigaon, Balipara, Biswanath Chariali, Ranganadi are being kept open in off peak hours to maintain the nodal voltages within stipulated limits.

8.3 He also said that presently 420 kV 2x80MVAR Bus Reactors are in service at Biswanath Chariali. So, in order to contain high voltage in upper Assam and Arunachal Pradesh, POWERGRID has proposed that two out of four 63 MVAR Line Reactors at Biswanath Chariali may be utilized as Bus Reactors.

8.4 GM, POWERGRID suggested that in order to have better control of the over voltages all the four line reactors may be converted as bus reactors.

ISO 9001 & 14001
OHSAS 18001

नॉर्थ ईस्टर्न इलेक्ट्रिक पावर कॉर्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
NORTH EASTERN ELECTRIC POWER CORPORATION LTD.
(A Government of India Enterprise)

No. CMD/ND/120/ 1576

दिनांक/Dated: 05.11.2020

सेवा में/To,

The Chairperson
Central Electricity Authority,
Sewa Bhawan,
R. K. Puram,
New Delhi-100066.

विषय/Sub: Strengthening of evacuation system of Pare HEP of NEEPCO.

महोदय/ Dear Sir,

Reference is invited to the minutes of 6th Meeting of Standing Committee on Power System Planning of North Eastern Region wherein a new evacuation system has been formulated for Pare HE Plant keeping in mind the strengthening of the evacuation system as a part of the North Eastern Region Strengthening Scheme – IX (NERSS-IX) as follow:

a) Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi - Naharlagun / Nirjuli 132 kV S/C line –by NEEPCO.

b) Pare HEP (from LILO point) – North Lakhimpur (Assam Electricity Grid Corpn.Ltd AEGCL) 132kV D/C line (with ACSR Zebra conductor) along with 2 no. 132 kV line bays at North Lakhimpur – ISTS (implementation through Tariff-Based Competitive Bidding (TBCB)/ Regulated Tariff Mechanism (RTM) to be decided by empowered committee).

c) LILO of one circuit of Pare HEP – North Lakhimpur (AEGCL) 132kV D/C line (with ACSR Zebra) at Nirjuli substation – ISTS (implementation through TBCB/RTM to be decided by empowered committee).

d) Re-conductoring of LILO portion at Pare end (of Ranganadi – Naharlagun / Nirjuli 132kV S/c line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP – by NEEPCO.

e) 2 no. 132 kV bays at Nirjuli S/S for termination of LILO of one circuit of Pare HEP – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra) – ISTS by POWERGRID

From the discussion held in the 2nd meeting of North Eastern Regional Power Committee (Transmission Planning) (NERPCTP), it is revealed that the work under the scope of sl. no. at (b) and (c) above are allotted under TBCB and presently in progress.

While acknowledging the effort of CEA in regard to reliable and effective transmission planning in the Country as a whole and for NE Region in particular, we would like to bring the following submission for your kind consideration: -

ISO 9001 & 14001
OHSAS 18001

नॉर्थ ईस्टर्न इलेक्ट्रिक पावर कॉर्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
NORTH EASTERN ELECTRIC POWER CORPORATION LTD.
(A Government of India Enterprise)

1. You are aware that the 2X55 MW Pare HE Plant in the State of Arunachal Pradesh was commissioned by NEEPCO in May 2018 with a time overrun of 70 months which in turn led to cost overrun for reasons beyond the control of the Corporation.
2. The evacuation system from the Plant was executed as per the approved scheme of CEA.
3. The present normative tariff based on the cost allowed by CERC stands at Rs. 7.23 per unit which is considered to be on the higher side by the beneficiary States of the Plant. NEEPCO was compelled to relook at the tariff structure and are trying to lower down the tariff to a comfortable level of beneficiaries for smooth operation of the Plant with partial recovery of capital cost and utilization of the natural resources to the fullest extent. This has led to absorption of substantial financial burden in the form of under recovery.
4. Further addition of the capital cost involved with the revised transmission scheme as stated above, shall either add burden to the beneficiaries or to the Corporation.
5. NEEPCO generally is not involved with the execution of transmission line and hence it is not possible to take up the work under the scope at sl. nos. (a) & (d) on its own. Engagement of other agency again, will lead to increase in the completion cost.

Sir, you will appreciate that commissioning of hydro projects in NE Region, itself is a challenging job. Being an organization with business area restricted to NE Region only, NEEPCO has to absorb a lot of challenges including financial losses. NEEPCO is not at all in a position to take further financial burden at this juncture.

Under the compelling circumstances, we would like to request you to kindly relieve NEEPCO from further investment against Pare HE Plant and hence, the work under the scope at sl. no.- (a) and (d) may be taken up through the successful TBCB agencies or otherwise expenditure may be granted from Power System Development Fund (PSDF)/ MoDONER as the same is under system strengthening scheme.

This is for your kind review and consideration please.

With regards,

भवदीय/yours faithfully

05/11/2020

(V. K. Singh)
Chairman and Manging Director

Copy for kind information to: -

1. Joint Secretary (H), Ministry of Power, Govt. of India, Shram Shakti Bhawan, New Delhi

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग-II
Power System Planning & Appraisal Division-II

सेवा में / To
As per list of Addresses

विषय/**Subject**: **Minutes of meeting held on 17.08.2021 to discuss issues related to Strengthening of evacuation system of Pare HEP of NEEPCO.**

महोदय/Sir,

To discuss the issues related to strengthening of evacuation system of Pare HEP of NEEPCO, a meeting was held under the chairmanship of Chief Engineer (PSPA-II), CEA on 17.08.2021. The minutes of the meeting are enclosed herewith.

भवदीय/Yours faithfully,

Encl.: As above.

Signature Not Verified
Digitally signed by
B.S.BAIRWA
Date: 2021.08.18 18:06:55 IST

(बी.एस. बैरवा/ B.S. Bairwa)
निदेशक/Director

List of Addresses:

1	The Member Secretary, North Eastern Regional Power Committee(NERPC), Meghalaya State Housing Finance Co-Operative Society Ltd. Building Nongrim Hills, Shillong (Meghalaya) – 793003	2	COO(CTU), Power Grid Corporation of India Ltd., “Saudamini” Plot no-2, Sector-29, Gurugram-122001, Haryana
3	Executive Director National Load Despatch Centre B-9, Qutab Institutional Area New Delhi-110016	4	Executive Director , North Eastern Load Despatch Centre (NERLDC), Power System Corporation Operation Limited (POSOCO) POWERGRID Complex, Dongteih, Lower Nongrah, Lapalang, Shillong- 793006, Meghalaya, India
5	The Chairman and Managing Director North Eastern Electric Power Corporation Ltd. Brookland Compound, Lower New Colony, Shillong (Meghalaya)- 793003		

Copy to:

PPS to Member (PS), Central Electricity Authority, Sewa Bhawan, R. K. Puram, New Delhi.

Minutes of the meeting held on 17.08.2021 to discuss issues related to Strengthening of evacuation system of Pare HEP of NEEPCO

A meeting to discuss the issues related to strengthening of evacuation system of Pare HEP of NEEPCO was held on 17.08.2021 via video conferencing which was participated by CEA, CTU and NEEPCO. NERPC and NERLDC could not participate due to non-availability of internet in Shillong during this time. List of Participants is enclosed at **Annexure-I.** Chief Engineer (PSPA-II), CEA welcomed the participants in the meeting. He requested Director (PSPA-II), CEA to brief the agenda.

1. Director (PSPA-II), CEA stated that in the 06th meeting of SCM-NER held on 03.10.2016, for strengthening of evacuation system of Pare HEP of NEEPCO, following additional/ modification in the transmission system associated with Pare HEP were to be carried out by NEEPCO as a part of NERSS-IX:

    i. Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi - Naharlagun / Nirjuli 132 kV S/C line.

    ii. Re-conductoring of LILO portion at Pare end (of Ranganadi – Naharlagun / Nirjuli 132kV S/c line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP.

    He, further stated that NEEPCO vide their letter dated 19.07.2021 has intimated their difficulty to carry out the above works because of financial hardship. He requested NEEPCO to state the issue in implementation of the works which were agreed in 2016.

2. Representative of NEEPCO stated that the present normative tariff based on the cost allowed by CERC stands at Rs. 7.23 per unit which is considered to be on the higher side by the beneficiary States in NER. NEEPCO was compelled to relook at the tariff structure and are trying to lower down the tariff to a comfortable level of beneficiaries for smooth operation of the Plant with partial recovery of capital cost and utilization of the natural resources to the fullest extent which is of the order of Rs. 5/unit. This has led to absorption of substantial financial burden in the form of under recovery. Therefore, NEEPCO is not in a position to do any further investment w.r.t. works agreed under NERSS-IX.

3. Chief Engineer (PSPA-II), CEA enquired whether NEEPCO had estimated the scope of works to be implemented by NEEPCO and its cost estimates.

4. Representative of NEEPCO informed that they had not carried out the detailed exercise of estimating the scope of the works to be done and its cost implication. However, roughly, it is estimated that reconductoring works (with HTLS Zebra conductor) of around 1.5 km for D/c line from Pare HEP to LILO point and its stringing is pending. Bus, 2 circuit breakers and isolators at Pare HEP are rated at capacity of 1600A. All the CTs are with CTs ratio of 800A. As such, if HTLS is carried out with Zebra equivalent, then all the CTs of these two bays (around 07 including 01 spare) may also need to be replaced.

5. Representative of CTU stated that in NER, as per the estimates of their engineering team, reconductoring of 132kV S/c line costs around Rs. 30-35 lacs per km per circuit. He also stated that for Zebra conductor, the ampacity is only 770A (at 85°C considering ambient temperature of 45°C) as given in recent RFP. As such, the CTs of 800A may not need replacement. NEEPCO need to definitely carry out the works of Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi - Naharlagun / Nirjuli 132 kV S/C line. Otherwise, the works carried out by the TSP i.e. Pare HEP (from LILO point) – North Lakhimpur (AEGCL) 132kV D/c line (with ACSR Zebra conductor) along with 2 no. 132 kV line bays at North Lakhimpur, will remain idle.

6. Representative of CTU presented the system study and implication of not reconductoring the lines (enclosed at **Annexure-II**). He stated that in base case (wherein planned system is assumed to be taken up), with Pare HEP generation at 110MW and Ranganadi HEP generation at 360MW, flow on Pare-N.Lakhimpur and Pare-Nirjuli 132kV S/c lines is of the order of 62-67 MW. However, in case of N-1 contingency of Pare-N.Lakhimpur 132kV S/c line, flow on Pare-Nirjuli 132kV S/c line becomes 93 MW which is more than the thermal limit of the line. This was the reason of planning reconductoring of LILO portion with HTLS Zebra line. To reduce the flow below 90MW, generation at Pare HEP needs to be reduced from 110MW to 80 MW.

7. Chief Engineer (PSPA-II), CEA stated that in case only reconductoring of LILO portion is to be carried out, then it should not cost more than Rs. 1.5 Crores. He suggested that this small investment by NEEPCO can be recovered through tariff or some alternate arrangement like fund pooling by NER states can be considered, which may be supported by NERPC, if possible. He further stated that as evident from the studies, if the system is not implemented by NEEPCO, they may have to back down generation of Pare by about 30MW to keep the line loading within limits. The commercial decision of implementing this scheme v/s backing down the generation needs to be taken by NEEPCO.

8. Representative of NEEPCO stated that straightening of line would also require erection of new towers and may need some more funds. However, they will put up these suggestions to their management which will take the final decision.

Chair thanked all the participants for valuable time and suggestions.

*****

Annexure-I

List of participants to the meeting

CEA:

1. Shri Pardeep Jindal, Chief Engineer (PSPA-II)
2. Shri B.S. Bairwa, Director (PSPA-II)
3. Shri Deepanshu Rastogi, Deputy Director (PSPA-II)
4. Sh. Manish Maurya, Assistant Director (PSPA-II)

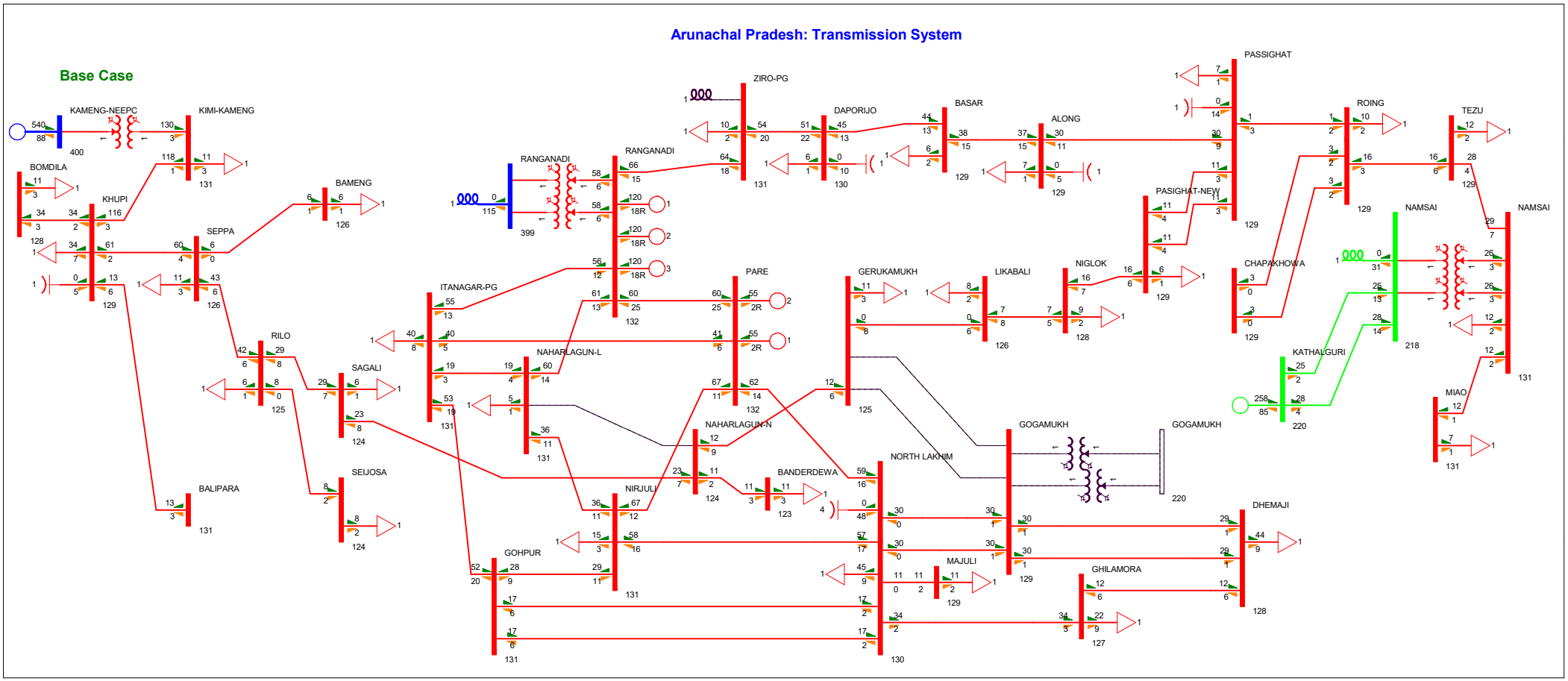
CTUIL:

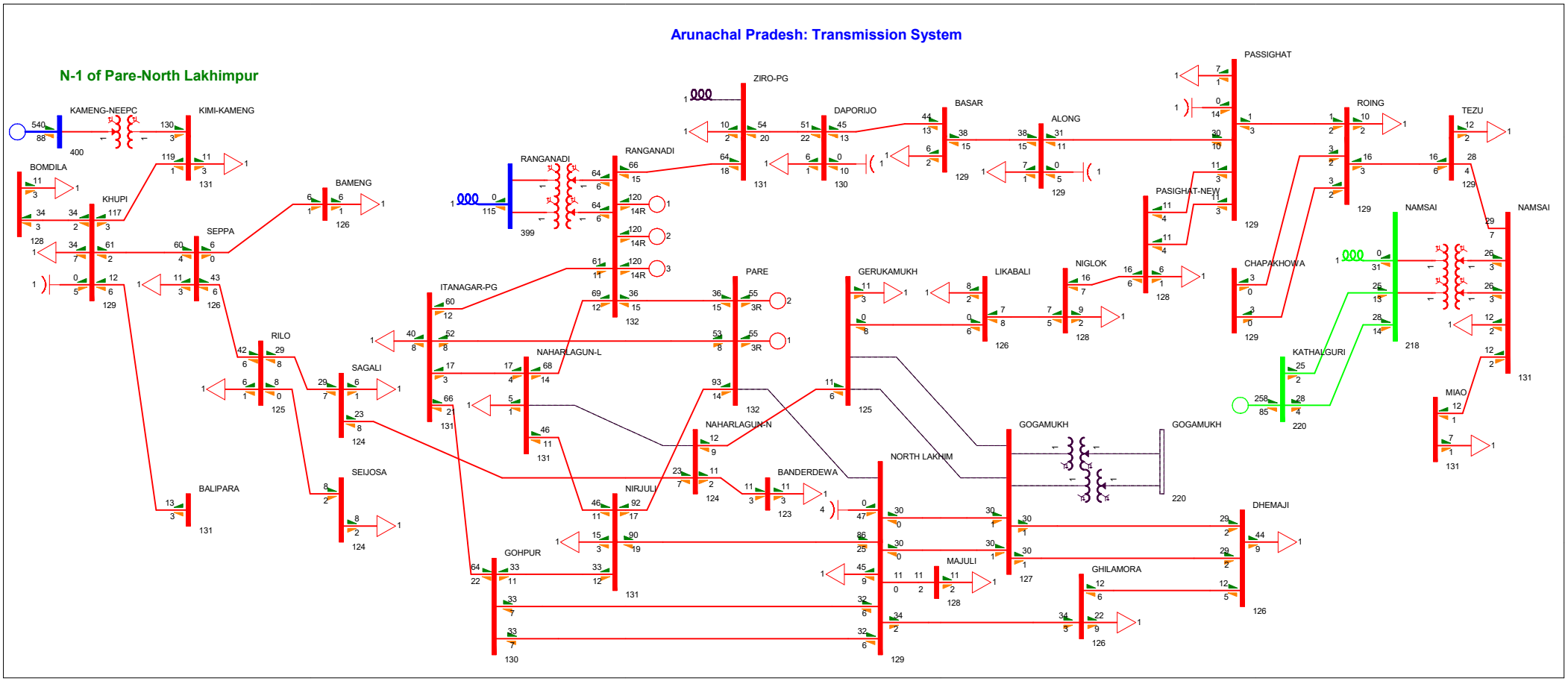
1. Shri Ashok Pal, CGM (CTU)
2. Shri Manish Ranjan Keshari, Manager (CTU)

NEEPCO:

1. Shri Saamarjit Chakravarty, ED-O&M
2. Shri Bhaskar Goswami, DGM, O/O ED (O&M)
3. Shri Joypal Roy, DGM, O/O ED-O&M

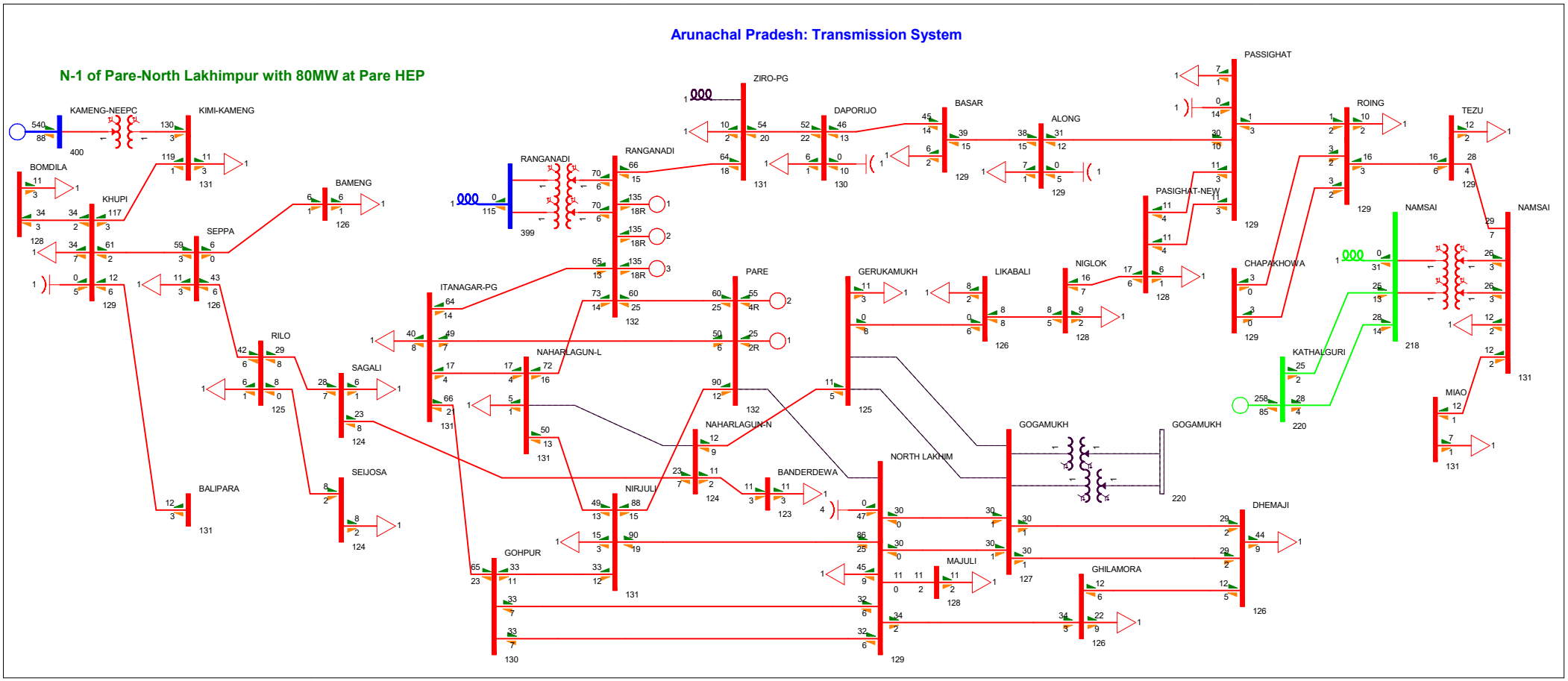
Annexure-II


Arunachal Pradesh: Transmission System
Base Case
KAMENG-NEEPC
KIMI-KAMENG
BOMDILA
KHUPI
BAMENG
SEPPA
RILO
SAGALI
SEIJOSA
BALIPARA
ITANAGAR-PG
RANGANADI
ZIRO-PG
DAPORIJO
BASAR
ALONG
PASSIGHAT
PASIGHAT-NEW
ROING
TEZU
NAMSAI
CHAPAKHOWA
KATHALGURI
MIAO
PARE
NAHARLAGUN-L
NAHARLAGUN-N
NIRJULI
GOHPUR
BANDERDEWA
GERUKAMUKH
LIKABALI
NIGLOK
NORTH LAKHIM
MAJULI
GOGAMUKH
GHILAMORA
DHEMAJI


Arunachal Pradesh: Transmission System
N-1 of Pare-North Lakhimpur
KAMENG-NEEPC
KIMI-KAMENG
BOMDILA
KHUPI
SEPPA
BAMENG
BALIPARA
RILO
SAGALI
SEIJOSA
ITANAGAR-PG
RANGANADI
ZIRO-PG
DAPORIJO
BASAR
ALONG
PASSIGHAT
PASIGHAT-NEW
ROING
TEZU
NAMSAI
CHAPAKHOWA
KATHALGURI
MIAO
PARE
NAHARLAGUN-L
NAHARLAGUN-N
NIRJULI
GOHPUR
BANDERDEWA
NORTH LAKHIM
MAJULI
GERUKAMUKH
LIKABALI
NIGLOK
GOGAMUKH
GHILAMORA
DHEMAJI

Arunachal Pradesh: Transmission System

N-1 of Pare-North Lakhimpur with 80MW at Pare HEP



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग-II
Power System Planning & Appraisal Division-II

सेवा में / To

Sh. H.K. Deka
Director (Technical)
North Eastern Electric Power Corporation Ltd.
Brookland Compound, Lower New Colony,
Shillong (Meghalaya)- 793003

विषय/**Subject**: New Evacuation system for 110 MW Pare HE Plant, Arunachal Pradesh, under the North Eastern Region Strengthening Scheme -IX (NERSS - IX) -reg.

सन्दर्भ/**Reference**: NEEPCO letter No. NEEPCO/D(T)/PHEP-7/2021-22/185 dated 19.07.2021

महोदय/Sir,

This has reference to NEEPCO letter dated 19.07.2021 requesting to relieve NEEPCO from further investment against Pare HEP for the following scope of works (agreed under NERSS-IX):

- Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi - Naharlagun / Nirjuli 132 kV S/C line.
- Re-conductoring of LILO portion at Pare end (of Ranganadi – Naharlagun / Nirjuli 132kV S/c line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP.

In this regard, it is to mention that scheduled commissioning date of Pare HEP (NEEPCO) (from near LILO point)– North Lakhimpur (AEGCL) 132 kV D/c line (with ACSR Zebra conductor) along with 2 no. 132 kV line bays at North Lakhimpur end by TSP i.e. Sterlite is 22.06.2023.

In case, scope of reconductoring works is not completed by NEEPCO, the line section being implemented by TSP will have to be connected to existing LILO point. This will result in reduction of the capacity of Pare-North Lakhimpur 132kV D/c line via Nirjuli.

To assess the implication of restricted capacity of transmission line, system studies were carried out by CTU and discussed in a meeting held under the chairmanship of Chief Engineer (PSPA-II), CEA on 17.08.2021 with participation from CEA, CTU and NEEPCO (Minutes of the meeting are enclosed at Annexure). It was found that in case of N-1 contingency of Pare-North Lakhimpur 132kV S/c line, flow on Pare-Nirjuli 132kV S/c line becomes more than the thermal limit of the line. To reduce the flow on the transmission line for safe operation of NER grid, the generation of Pare HEP will have to be reduced to 80 MW from 110MW.

In the meeting, it was also brought out that the commercial decision of implementing this scheme v/s backing down the generation needs to be taken by NEEPCO.

Therefore, you are requested to inform your decision in this regard.

भवदीय/Yours faithfully,

संलग्न/Encl.: As above.

23/08/2021

(प्रदीप जिंदल/ Pardeep Jindal)
मुख्य अभियंता/Chief Engineer

प्रतिलिपि/Copy to:

1. Director (Trans.), MoP, New Delhi
2. ED, NERLDC, Shillong
3. COO, CTU, Gurugram

North Eastern Regional Power Committee

MINUTES OF SPECIAL MEETING TO DISCUSS IMPORTANT ISSUES PERTAINING TO 132kV PARE-NORTH LAKHIMPUR

Date : 18/11/2021 (Thursday)

Time : 11:00 hrs

Venue : NERPC Shillong (over Video-Conferencing).

The List of Participants in the Meeting is attached at **Annexure – I**

Sh. B. Lyngkhoi, Member Secretary(i/c), NERPC welcomed all the members to the meeting. He informed that in follow-up to CEA Special Meeting held on 17th August 2021 this meeting has been convened. Further he intimated the members that minor modification has been sought by NEEPCO regarding HTLS upgradation of LILO portion, for which discussion is still ongoing with CEA. He requested the members to discuss in detail the following issues:

1. Pare evacuation via approved 132 kV Pare- North Lakhimpur D/C
2. Upgradation of LILO portion of 132 kV Ranganadi - Lekhi at Pare.
3. Straightening of 132 kV Ranganadi-Nirjuli Lekhi line.

He appreciated the presence of participants from NEEPCO, NERTS and M/s STERLITE for discussion & requested DD, NERPC to take up the agenda item(s).

ITEM NO. 1 : PARE EVACUATION VIA APPROVED 132KV PARE-NORTH LAKHIMPUR D/C

The status of 132kV Pare- Nirjuli – N. Lakhimpur T/L and 132kV Pare – North Lakhimpur T/L

Deliberation in the meeting:

Representative of M/s STERLITE stated that the lines are in various stages of completion as follows:

Foundation: 14 out of 91 foundations for main line completed, all 57 foundations for LILO portion (S/C LILO at Nirjuli) to be done.

Arunachal Pradesh portion – From 16th Jan'22 (for Main line) material shifting will be done

He requested the forum to highlight the arrangement for termination at Pare HEP.

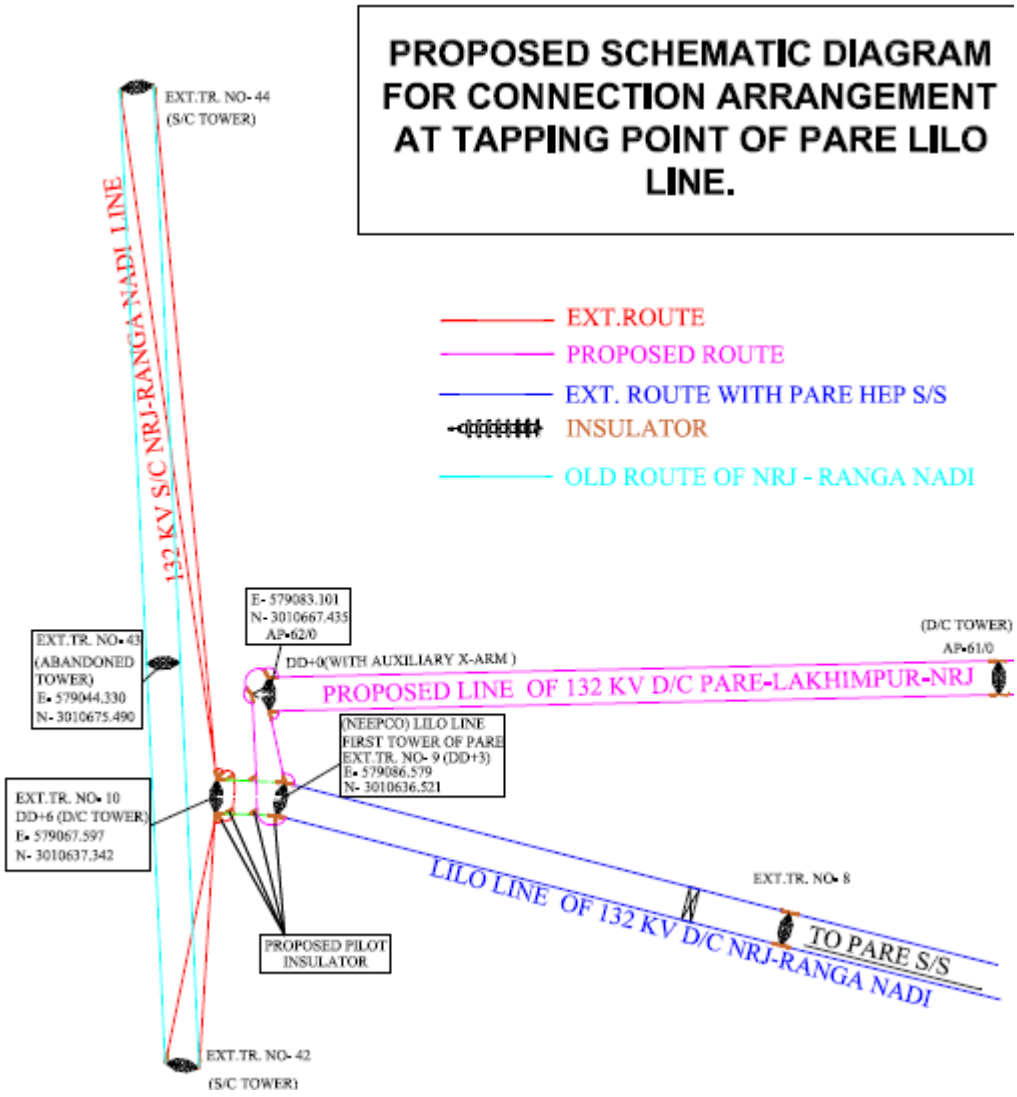


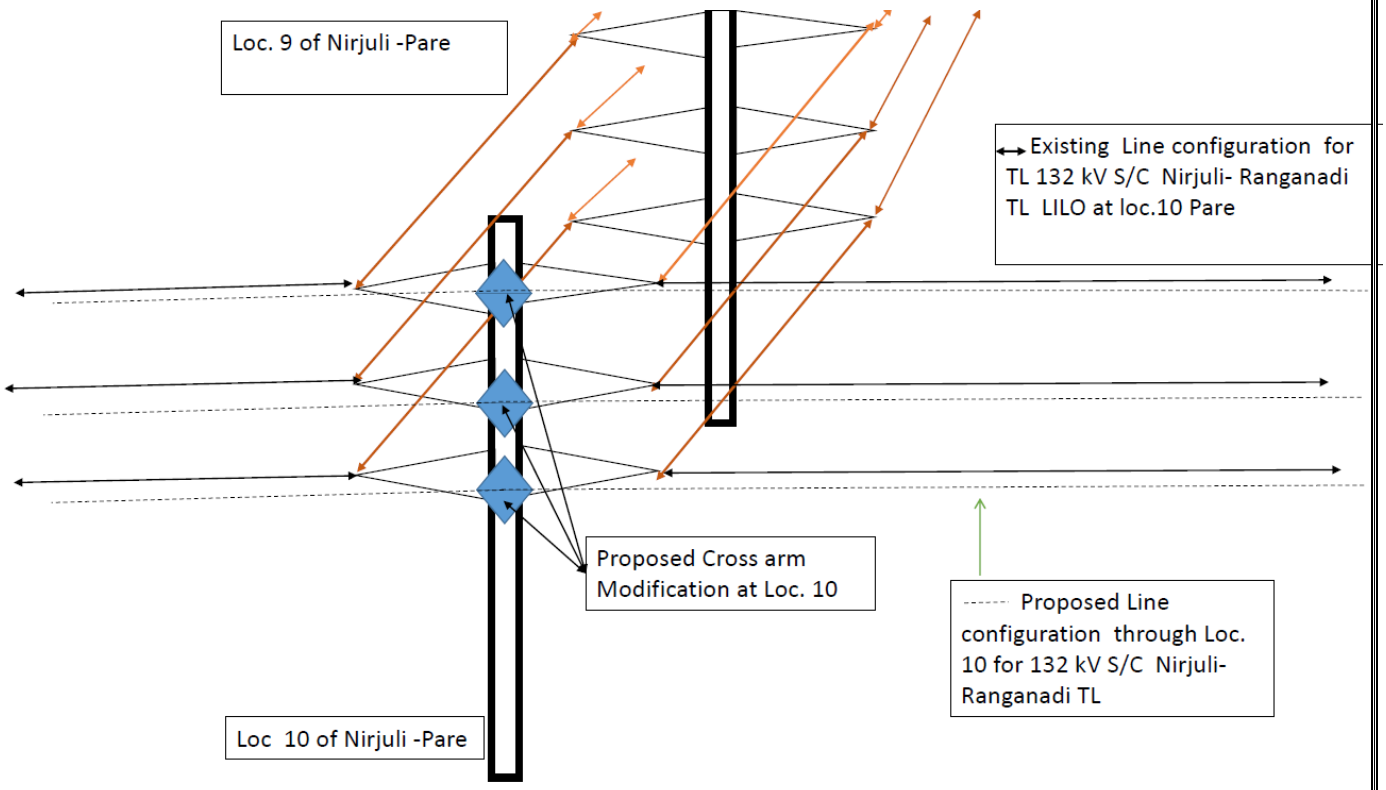
Fig.1.

Sr.GM(AM), NERTS stated that erstwhile NDTL line when LILO'ed at Pare one tower Loc 43 (of the original line) was abandoned and the line was terminated via two new towers Loc 10 and Loc 9 to Pare HEP. The same is shown in Fig.1 above.

On suggestion of the forum M/s STERLITE had submitted (on 15th Dec'21) the detailed engineering drawing with their proposed solution. The same is attached at **Annexure-I.**

Thereafter, a joint visit was carried out by NERTS-POWERGRID and M/s STERLITE and the following solution was agreed to:

(i) To provide additional Auxiliary cross arms in 132kV Tower(DD type) at Loc 10 of the LILO portion so that Line will go directly from Nirjuli -Lekhi to Ranganadi via Loc 10, without any connection with 132kV D/C Pare-Lakhimpur line of M/s STERLITE. Necessary strengthening (if any) may be taken care of by NEEPCO Ltd. Arrangement proposed is shown in the sketch below:



(ii) Connection of 132kV Pare-N.Lakhimpur and 132kV Pare-Nirjuli via Tower at Loc 9 as suggested by M/s STERLITE.

Also, mechanical strength verification of the towers/ conductors due to the proposed scheme of tapping from mid span between Loc 9 & Loc 10 to be looked into by M/S STERITE.

After detailed deliberation, the above solution was referred to NCT/CEA for approval.

The forum noted as above.

Action: NERTS, M/s STERLITE, NERPC.

ITEM NO. 2 : UPGRADATION OF LILO PORTION OF 132 KV RANGANADI - Lekhi AT PARE

At 6th Standing Committee Meeting held at Imphal on 03-10-2016 the following were decided(amongst others) under NERSS-IX:-

- *Bypassing of LILO of Ranganadi – Lekhi at Pare HEP so as to form direct Ranganadi – Lekhi 132kV S/C line – ISTS by NEEPCO*
- *Re-conductoring of LILO portion at Pare end (of Ranganadi – Lekhi 132kV S/C line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP – ISTS by NEEPCO*

Deliberation in the meeting

ED(O&M), NEEPCO intimated the forum regarding difficulties (to be faced) by NEEPCO in adjustment of tariff due to additional works. Further he intimated that NEEPCO has not received any offer from M/s STERLITE

GM(SO-II), NERLDC stated that (i)Thermal limit of the line(LILO portion) will be exceeded in event of full generation from Pare HEP without HTLS upgradation. Hence generation might have to be curtailed without upgradation, (ii)Existing CTR of 800/1 is sufficient, (iii)other bay equipments are to be upgraded.

The forum noted that the approximate cost under the above scope is around INR 2 Crores.

After detailed deliberation the forum suggested that once CEA approved the solution for termination of 132 Pare- North Lakhimpur D/C, the scope executing agency under this item shall be decided by NCT/CEA.

The forum noted as above.

Action: NERPC.

ITEM NO. 3 : STRAIGHTENING OF 132 KV RANGANADI-Lekhi LINE

Deliberation in the meeting

Representative of M/s STERLITE stated that in addition to straightening of 132kV RHEP- Lekhi line by bypassing of LILO at Pare HEP following additional issues must be addressed:

(i) Continuance of fiber connectivity of Pare HEP

(ii) PLCC for the two new lines to be terminated at Pare HEP

(iii) Voice and data communication at Pare HEP

GM, NEEPCO stated that presently Pare HEP is communicating via OPGW laid on 132kV RHEP-Pare (NDTL) and the same is used for LDP of both circuits from 132kV RHEP-Pare HEP. He requested that the arrangement be not disturbed and in event of any changes due to bypassing alternative may be decided by the forum. Manager, NERTS stated that presently OPGW is laid till Pare HEP from RHEP. After detailed deliberation the forum decided to take up the above issues after finalization of above issues at Item No. 1&2.

The forum noted as above.

Action: NERPC.

******

Annexure-I

List of Participants in the Special Meeting held on 18.11.2021

SN	Name & Designation	Organization	Contact No.
1	Sh. S. Patel, Sr. GM(AM)	NERTS	-
2	Sh. Navin Mahato, CM(AM)	NERTS	-
3	Sh. P. Nandi, Manager (AM)	NERTS	-
4	Sh. Nabarun Roy, CGM (I/c)	NERLDC	-
5	Sh. Samar Chandra De, GM	NERLDC	-
6	Sh. Sourav Mandal, Dy. Mgr. (SO-I),	NERLDC	-
7	Sh. Chitra Thapa, SO-II	NERLDC	-
8	Sh. B. Lyngkhoi, MS(i/c)	NERPC	-
9	Sh. S. Mukherjee, Dy. Director	NERPC	-
10	Sh. Narottam Chakraborty	M/s STERLITE	
11	Sh. Arindam Kar	M/s STERLITE	
12	Sh Bhuwanesh Joshi	M/s STERLITE	
13	Sh. Sandip Maity	M/s STERLITE	

भारत सरकार
Government of India
विद्युतमंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली अभियांत्रिकी एवं प्रौद्योगिकी विकास प्रभाग
Power System Engineering & Technology Development Division

To,

1. **Executive Director (Engg),**
   Power Grid Corporation of India Limited,
   "Saudamini", Plot no.2, Sector-29, Gurugram-122001.'
   Haryana

2. **Narottam Chakraborty**
   Project Head-WRNER, Part-D
   M/s. Sterlite Power

विषय: Minutes of Meeting held on 08.04.2022 under Chairmanship of Chief Engineer (PSETD),CEA to discuss the issue of Straightening of 132 kV Ranganadi-Pare-Nirjuli line-reg.

Reference: NERPC's letter no. NERPC/OP/Committee/2022/08 dated 01.04.2022

महोदय**,**

The minutes of the Meeting, held on 08.04.2022 under Chairmanship of Chief Engineer (PSETD), CEA to discuss the issue in detail and evaluate the available alternative arrangements for straightening of 132 kV Ranganadi-Pare-Nirjuli line, are attached herewith for information and necessary action please.

संलग्न /Encl. - उपरोक्त / as above.

भवदीय,

मोहित मुदगल

मोहित मुदगल
उप निदेशक

Minutes of the Meeting taken by Chief Engineer (PSETD) on 08.04.2022 in CEA to discuss the issue of straightening of 132 kV Ranganadi-Pare-Nirjuli line with POWERGRID and M/s Sterlite.

List of Participants is attached an **Annex.**

1. Chief Engineer (PSETD), CEA welcomed all the participants and mentioned that NERPC vide its letter dated 01.04.2022 had invited reference to the discussions held during the 22nd TCC/RPC meeting on 26th March 2022 and requested CEA to examine and suggest the suitable alternatives for straightening of 132 kV Ranganadi-Pare-Nirjuli line so that the works can be executed by NEEPCO. He informed that this meeting has been called to discuss the issue in detail and requested participants to deliberate on the possible alternatives for straightening of 132 kV Ranganadi-Pare-Nirjuli line to finalise an all acceptable solution.

2. Powergrid representatives proposed the following two alternatives for straightening of 132 kV Ranganadi-Pare-Nirjuli line for deliberations. An indicative sketch for the following arrangements was also provided by Powergrid for reference. (Attached as Annexure-I)

   a. **Option 1:** To restore the 132kV Ranganadi-Nirjuli line on original arrangement i.e., via the spare tower at location no 43 which is at present abandoned, provided that this is feasible and no ROW issue is involved. This option will ensure isolation of this line from tower at location 10.

   b. **Option-2**: Dismantle tower no. 10 upto butt joint below cross arm level and re-erect the tower by rotating the cross arm/ tower by 90 degree so as to connect POWERGRID Line directly from Nirjuli to Ranganadi via Loc 10 and this line shall be completely isolated from LILO line.

      Further, to connect the line from loc. No- 9 to loc. 62, additional Auxiliary cross arms shall be provided on the tower at loc. No -9. The BOM, Drawing and Shop Floor Drawing for Auxiliary cross-Arm shall be provided by POWERGRID.

3. The above mentioned proposals were discussed in detail and all the participants were generally in agreement to the proposed options. After deliberations, following was concluded:

   a. The abovementioned proposals of POWERGRID are technically feasible and can be adopted for straightening of 132 kV Ranganadi-Pare-Nirjuli line.

   b. One of the options mentioned above for implementation shall be explored based on the feasibility and techno-economic analysis.

   c. While execution of the proposed arrangements, it shall be ensured that the all the necessary Safety and Electrical clearances, as specified in relevant regulations, are maintained.

d. Only technical feasibility of the available options has been deliberated in the meeting and all the commercial/financial aspects of the proposals shall be mutually decided by the affected parties.

Meeting ended with a vote of thanks to the Chair.

****

ANNEX

List of Participants

CEA

1.	Shri. A. K. Thakur	Chief Engineer, PSETD
2.	Shri Y. K. Swarnkar	Director, PSETD
3.	Shri Mohit Mudgal	Deputy Director PSETD
4.	Shri. Manoj	Assistant Director PSETD

POWERGRID

1.	Shri. Nitesh Kumar Sinha	DGM (Engg-TL)
2.	Neeraj Singh Gautam	DGM (Engg-TL)

M/s. Sterlite Power

1. Shri. Chandan Kalra
2. Shri. Amit Mahajan
3. Shri. Keshav Chandra

Sterlite Power

BESPOKE SOLUTIONS & CUTTING-EDGE PRODUCTS TO ENHANCE POWER TRANSMISSION CAPABILITIES

132 KV D/C NEEPCO PARE LINE

Contents

Reconductoring Proposal

1. Offer letter:

SPTL/FY 21-22/PARE/003

Date: 28/06/2022

To,

Tseten Sange

Dy. General Manager (E/M)

Pare HEP, NEEPCO Ltd

Sub: - Budgetary Proposal for Reconductoring of 132 KV D/C NEEPCO Pare Line

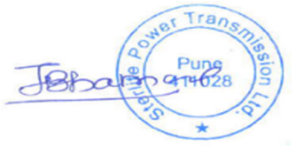
Dear Sir,

We take this opportunity to share with you that Sterlite Power Transmission Ltd is a leading global solution provider of Transmission projects, OPGW, Power cables and Power Transmission conductors and major player in HTLS conductors.

We hereby submit our offer for 132 KV D/C NEEPCO Pare Line: Reconductoring with ACCC along with necessary hardware, insulators and accessories.

Yours Sincerely

For Sterlite Power Transmission Limited.



Jayavant Bhamare

AVP- Sales & Business Development

2. Annexure A Commercial Proposal

A. Scope:

I. Destringing and Restringing of 132 KV D/C NEEPCO Pare Line 2.25 Ckm Portion: Reconductoring with ACCC Casablanca conductor along with necessary hardware, insulators and accessories.
II. Changing relay setting parameter using updated line configuration relay setting calculation to be done accordingly and implemented.
III. Straightening of Ranganadi -Nirjuli line by changing cross arm orientation at Tower No.10 of LILO line of Pare.

The scope is limited to aforesaid only and does not include any scope towards ROW, transmission towers, substation works, bay works or any commissioning works related to any transmission line or substation.

B. Major Commercial Terms

#	Terms	Details
1	Payment Terms	**Supply** • 10% Advance • 85% on Dispatch of Materials • 5% on commissioning **Services** • 10% Advance • 85% against RA bills • 5% on commissioning All payments to be made within 30 days of receipt of the invoice. Any delay in payment beyond 30 days shall lead to late payment surcharge @ rate of 14% per annum for the outstanding amount till the date of receipt of full payment.
2	Warranty Period	12 months from completion of Reconductoring works.
3	ROW & Way Leave	Shall be responsibility of the Utility. All approval, permissions, compensations and other cost related to ROW & Way leave shall be in scope of the Utility. Utility shall provide free and hindrance free access to site for carrying out the reconductoring works.
4	Change in Law	Any increase in cost or taxes due to Change in Law shall be compensated to SPTL at actuals.

5	Offer Validity	45 days from the date of the offer.
6	Shutdown	Shutdown required for Reconductoring shall be provided by the Utility.
7	Delays not attributable to Contractor	Suitable time extension and reimbursement of demonstrable cost shall be given to Contractor for suspension of work or delays not attributable to contractor.
8	Additional / Extra Item	In case of any additional items beyond the BOQ given in Annexure-II below, the same shall be executed by the Contractor as per mutually agreed rates.
9	Limitation of Liability	The contractor shall not be liable to client for any indirect or consequential loss or damage and the aggregate liability of the Contractor under the contract shall not exceed the contract price.
10	Governing Law	The contract shall in all respects be construed and interpreted in accordance with the laws in force in India.
11	Completion Period	3 months from the date of release of advance
14	Cancellation/Termination	In case of cancellation or termination of Contract for any reasons other than termination due to default of the Contractor, the following shall be paid by the Client :- a) For Work completed till the date of termination. b) Cost incurred by Contractor for demobilization including any losses to Contractor resulting due to order cancellation will be to CLIENT's account including any claims raised by suppliers, service providers, equipment providers & labour related cost. Any unpaid claims raised by the Contractor under the Contract.

3. Annexure B Bill of Quantities

Project : - 132 kV D/C Neepco Line					
Sl No.	**Supply BOQ**	**Qty**	**Unit**	**Unit Rate (INR)**	**Total Unit Rate (INR)**
1	Carbon Fibre Composite Core type HTLS Conductor	7.1	KM	1763879	12479271
2	Single Suspension Pilot fitting for Carbon Fibre Composite Core type HTLS Conductor	14.0	Nos	14413	201781
3	Vibration Damper suitable for Carbon Fibre Composite Core type HTLS Conductor	114.0	Nos	4409	502663
4	120KN Single Tension Fitting for Carbon Fibre Composite Core type HTLS Conductor	111.0	Nos	73025	8105765
5	Terminal Pad without hole	27.0	Nos	7062	190683
6	Relay Setting & Control System Integration	1	Set	2519108	2519108
7	T Connectors	9	Nos.	10580	95222
8	ACSR Panther Dead-end	6	Nos.	39676	238056
9	ACSR Panther MSJ	6	Nos.	31741	190445
10	ACSR Panther Repair sleave	4	Nos.	26451	105803
	TOTAL SUPPLY (Exc. GST)				**24628796**
Sl No.	**Service BOQ**	**Qty**	**Unit**	**Unit Rate (INR)**	**TotalUnit Rate (INR)**
1	Destrining & Restringing	2.246	Per Ckt KM	5038216	11315833
2	Dismantling of ACSR conductor	0.052	Per Ckt KM	251911	13099
3	Stringing of ACSR Conductor	0.293	Per Ckt KM	629777	184525
4	Dismantling of crossarm & installation	1	Per Ckt KM	377866	377866
	Total Services (Exc. GST)				11891324
	Total (Supply & Services) Exc. GST				**36520119**
Rupees Three Crore Sixty Five Lacs Twenty Thousand One Hundred Nineteen Only					

4. Notes:

a) Our offer is excluding GST @ 18%. Any change in rates of taxes, duties, levies shall be reimbursed at actuals by the Client.
b) Our offers exclude any cost towards ROW and Tower Strengthening.
c) The above Offer is fixed except for Conductor which is being offered on variable basis and price variation shall be as per weight to weight formula, considering LME Aluminium of USD 3664/MT and USD/INR exchange rate of INR 76.22 /USD. The conductor shall be payable based on actual LME and Exchange rate as on date of metal booking after award of the contract.
d) Detailed terms and conditions shall be mutually agreed at the time of signing of the contract.

Annexure-6.1

पूर्वोत्तर क्षेत्र के वित्तीय वर्ष 2022-23 के विचलन बकाया की स्थिति (पिछले साल सहित)

Deviation Outstanding status of NER for FY-2022-23 (including Last years O/S)

	29-08-2022	04-09-2022	तक		आज की तारीख में/As on	16-09-2022	Figs in Lacs
घटक/Constituents	Week no of NER-23 of FY 2022-23				टोटल / TOTAL		O/S PAYABLE >13 WEEKS
	पूल के लिए देय / Payable to Pool	पूल से प्राप्य / Receivable from Pool	भुगतान किया / Paid	प्राप्त / Received	O/S Payable to Pool	O/S Receivable from Pool	
अरुणाचल प्रदेश / Ar. Pradesh	21017.83	5545.71	20719.17	5545.71	298.66	0.00	0.00
असम / Assam	55891.85	1313.24	55891.85	1294.98	0.00	18.26	0.00
मणिपुर / Manipur	4532.74	3039.24	4389.21	3039.24	143.53	0.00	31.12
मेघालय / Meghalaya	5474.67	9724.62	5474.67	9716.63	0.00	7.99	0.00
मिजोरम / Mizoram	6698.63	5139.70	6698.63	5105.08	0.00	34.62	0.00
नगालैंड / Nagaland	8343.54	2889.32	8343.54	2876.72	0.00	12.60	0.00
त्रिपुरा / Tripura	16244.60	11068.54	16186.58	11068.54	58.02	0.00	0.00
लोकतक / Loktak	85.40	1112.75	82.02	1112.75	3.37	0.00	0.00
नीपको / NEEPCo	3608.44	23460.23	3608.44	23420.94	0.00	39.29	0.00
ई आर / ER	247161.51	596986.90	247161.51	594222.61	0.00	2764.29	0.00
ओटीपीसी/ OTPC	2585.22	6224.21	2578.34	6224.21	6.88	0.00	0.00
एनटीपीसी / NTPC	9847.72	4383.62	9757.65	4383.62	90.07	0.00	0.00
एन आर / NR	581191.40	245827.76	575416.47	245827.76	5774.93	0.00	0.00
बी.एन.सी / BNC	155.28	367.64	155.28	367.09	0.00	0.54	0.00
टोटल / TOTAL	962838.82	917083.50	956463.35	914205.90	6375.47	2877.59	

Annexure-6.2

REACTIVE POOL ACCOUNT DETAILS : 2021-22

Upto Week - 38 | As on 16.09.2022

All figures in ₹

		Till Previous FY		CURRENT FY				Reactive Bill settelement status		Interest Bill settelement status		Reactive+Interest Settlement	
Sl. No	States	Outstanding Payable (upto FY 20-21)	Outstanding Receivable (upto FY 20-21)	Payable to pool (2021-22)	Paid to pool (2021-22)	Receivable from pool (2021-22)	Received from pool (2021-22)	Outstanding Payable (upto FY 21-22)	Outstanding Receivable (upto FY 21-22)	O/S Reactive interest Payable till FY 20-21 2nd Half	O/S Reactive int. Receivable till FY 20-21 2nd Half	Net Outstanding Payable (upto FY 21-22)	Net Outstanding Receivable (upto FY 21-22)
0	0	1	2	3	4	5	6	1	2	7	8	0	0
1	Ar. Pradesh	-546892	161355	421170	-125722	647	-489285	0	651287	0	0	0	651288
2	Assam	-7159462	483776	57628	-7101834	510543	-11167617	0	12161935	0	0	0	12161936
3	Manipur	156043	-13944	579899	-8422	5522	-8422	744364	0	8226	0	752589	0
4	Meghalaya	0	-3763614	0	-6608926	1104187	-2659426	6608926	0	0	0	6608926	0
5	Mizoram	607867	-381974	355664	-779614	3942	-378032	1743145	0	0	0	1743145	0
6	Nagaland	-275783	64866	279802	4019	3590	-6035	0	74491	0	0	0	74490
7	Tripura	153143	31280	108	153251	65840	-583549	0	680668	0	0	0	680669
8	PSDF	0	-3646829	0	0	0	825118	0	-4471947	0	8225	0	-4463722
	TOTAL	-7065084	-7065084	1694271	-14467248	1694271	-14467248	9096435	9096435	8225	8225	9104660	9104661

Annex 6.3

अपूर्ण डीएसएम सुलह की स्थिति/ Pending DSM Reconciliation Status

				Last Signed		
Sl No.	Constituents	Period Pending	Total Pending	Qr. No.	FY	Date
1	Ar. Pradesh	Up to date	0	1	22-23	17-08-2022
2	Assam	Up to date	0	1	22-23	11-07-2022
3	Manipur	22-23(Q1)	1	4	21-22	02-06-2022
4	Meghalaya	Up to date	0	1	22-23	01-08-2022
5	Mizoram	Up to date	0	1	22-23	20-07-2022
6	Nagaland	Up to date	0	1	22-23	10-08-2022
7	Tripura	Up to date	0	1	22-23	12-07-2022
8	BNC	Up to date	0	1	22-23	27-07-2022
9	Loktak	22-23(Q1)	1	4	21-22	07-06-2022
10	NEEPCo	Up to date	0	1	22-23	22-07-2022
11	OTPC	Up to date	0	1	22-23	25-07-2022
12	NTPC	Up to date	0	1	22-23	07-07-2022
			2			

अपूर्ण रिएक्टिव सुलह की स्थिति/Pending Reactive Reconciliation Status

				Last Signed		
Sl No.	Constituents	Period Pending	Total Pending	Qr. No.	FY	Date
1	Ar. Pradesh	Up to date	0	1	22-23	17-08-2022
2	Assam	Up to date	0	1	22-23	18-08-2022
3	Manipur	22-23(Q1)	1	4	21-22	02-06-2022
4	Meghalaya	Up to date	0	1	22-23	01-08-2022
5	Mizoram	Up to date	0	1	22-23	01-08-2022
6	Nagaland	Up to date	0	1	22-23	10-08-2022
7	Tripura	Up to date	0	1	22-23	19-07-2022
			1			

Annexure-6.4

Case-I

2020-21 : Letter of Credit (LC) Amount against DSM charges

Figures in Rs.

Constituents	FY 20-21 DSM liability [DSM charges + Addl. DSM]	Average weekly DSM liability [A/52]	LC Amount [110% of B]	LC amt. (in Lakhs)
	A	B	C	D
AR. PRADESH	66054550	1270280	1397308	13.97
ASSAM	428038410	8231508	9054659	90.55
MANIPUR	30145186	579715	637687	6.38
MEGHALAYA	37646837	723978	796375	7.96
MIZORAM	18699967	359615	395576	3.96
NAGALAND	5587923	107460	118206	1.18
TRIPURA	61287976	1178615	1296476	12.96

Case-II

150% exceeded case of LC amount till Wk-52 of FY 2021-22

Constituents	150% of Case-I	Maximum (in a week) DSM liability of FY 21-22	Exceed of 150 % [where (B-A)>0]	Wk No of [B] where [C>0]	110% of B [where C>0]	LC to be open (in Lakhs) in FY 22-23
	A	B	C	D	E	F
AR. PRADESH	*2095962*	*22043582*	19947620	28	*24247940*	242.48
ASSAM	*13581988*	*28998905*	15416917	28	*31898796*	318.99
MANIPUR	*956530*	*3642793*	2686263	22	*4007072*	40.07
MEGHALAYA	*1194563*	*7279261*	6084698	31	*8007187*	80.07
MIZORAM	*593364*	*4001543*	3408179	2	*4401697*	44.02
NAGALAND	*177309*	*6743377*	6566068	29	*7417715*	74.18
TRIPURA	*1944715*	*18688358*	16743643	3	*20557194*	205.57

ANNEX 9.1

1. Historical demand/load data on hourly basis for different consumer categories viz. Domestic, Industrial, Commercial, Agriculture, etc. for the last 5 years (2017-18 to 2021-22)

Year	Time stamp	State	Consumer category wise Demand (MW)				
			Domestic	Commercial	Agriculture	Industrial	Others
2017-18	1st April 00:00						
	1st April 01:00						
	...						
	...						
	...						
	...						
	31stMarch 22:00						
	31stMarch 23:00						
2018-19	1st April 00:00						
	1st April 01:00						
	...						
	...						
	...						
	...						
	31stMarch 22:00						
	31stMarch 23:00						
...	...						
	...						
...	...						
	...						
2021-22	1st April 00:00						
	1st April 01:00						
	...						
	...						
	...						
	...						
	31stMarch 22:00						
	31stMarch 23:00						

2. Historical shifting of load from non-solar hours to solar hours-

State	Year	Load shifted to Solar Hours from non-solar Hours on annual basis(if any)			
		Agricultural	Industrial	Commercial	Others
	2016-17				
	2017-18				
	2018-19				
	2019-20				
	2020-21				
	2021-22				

3. Likely shifting of load which is envisaged from non-solar hours to solar hours in

State	Year	Load shifted to Solar Hours from non-solar Hours on annual			
		Agricultural	Industrial	Commercial	Others
State1	2022-23				
	2023-24				
	..				
	..				

Views of SLDCs/ Discoms on future load patterns (if any).

-Anticipated Changes in consumption pattern of different consumer categories in future years.
-Likely changes in the load shape for the day or month, shifting the daily peak from existing time of the day to other hours/ or likely change in peak month during the year.

Assam Power Distribution Company Limited

Key practices adopted to improve Efficiency and Commercial Viability

Efficiency improvement is the KEY to Commercial Viability

-------- ***unless funded by charity***

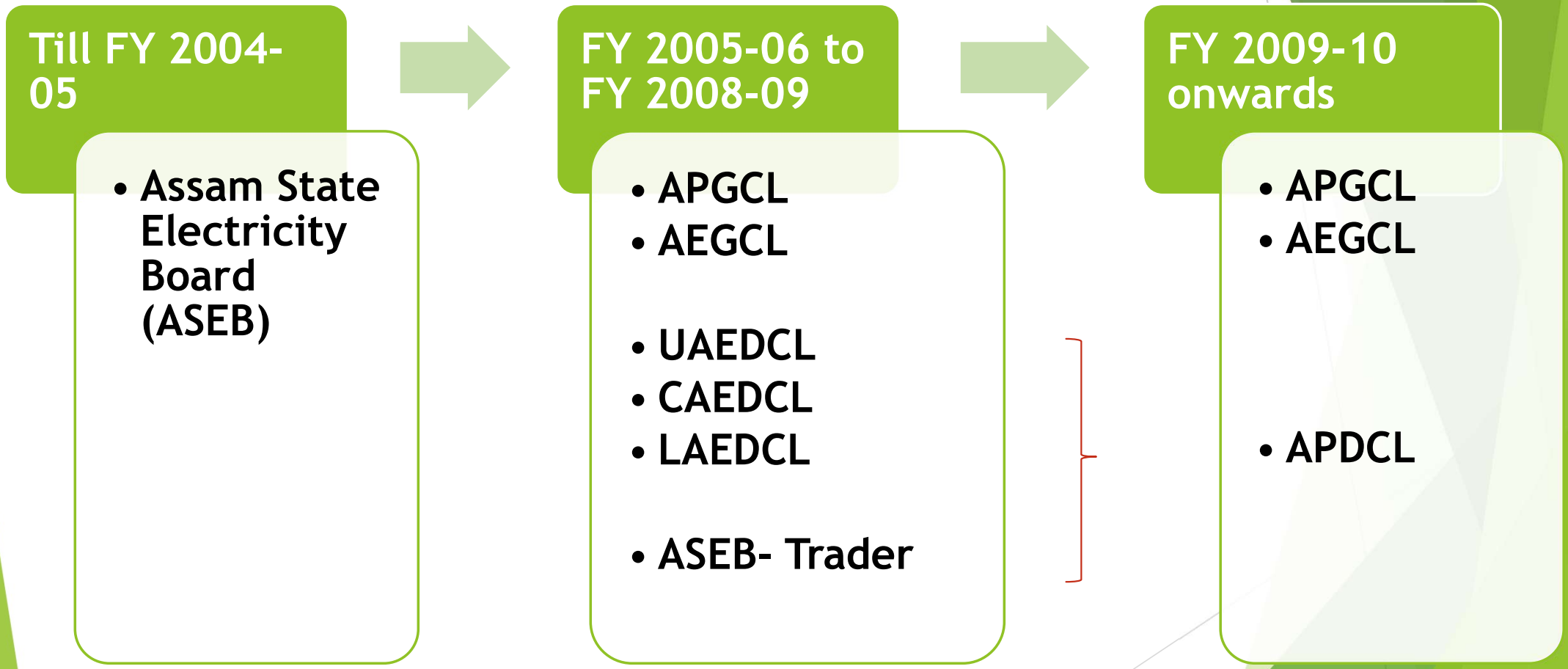
POWER SECTOR REFORMS IN ASSAM

- MoU signed with Govt. of India on Power Sector reforms in 2001.
- Tripartite Agreement Signed between GOI, ADB & GOA in Dec 2003.
- Unbundling of ASEB into five different utilities vesting Generation, Transmission, and Distribution activities are:
  - Assam Power Generation Corporation Ltd (APGCL)
  - Assam Electricity Grid Corporation Ltd (AEGCL)
  - Lower Assam Electricity Distribution Company Ltd (LAEDCL)
  - Central Assam Electricity Distribution Company Ltd (CAEDCL)
  - Upper Assam Electricity Distribution Company Ltd (UAEDCL)

• On 13th May, 2009, Government of Assam transferred and vested the functions, properties, interests, rights, obligations and liabilities of UAEDCL and CAEDCL along with the personnel of the said companies into LAEDCL w.e.f. 1st April 2009.

• LAEDCL was subsequently renamed as Assam Power Distribution Company Ltd. (APDCL).

Institutional Restructuring



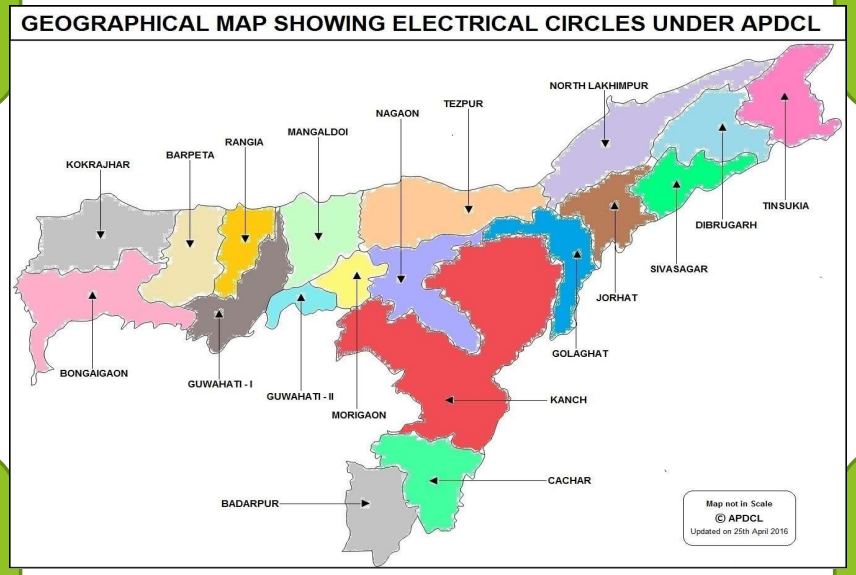
Journey since reform

Peak Demand (MW)	• 646 to 2426 • CAGR- 8%
33 kV feeders (Nos.)	• 225 to 506 • CAGR- 5%
Consumer base (Mn)	• 1.06 to 6.69 • CAGR- 11%
11 kV feeders (Nos.)	• 701 to 1656 • CAGR- 5%
DSS (Nos.)	• 166 to 547 • CAGR- 7%
DTRs (Nos. in lakh)	• 0.41 to 1.06 • CAGR- 5%

Present day APDCL- *at a glance*

Operational area

Area- 78 k Sq. KM
Zone - 8
Circle - 19
Division - 45
Sub-division - 158



Consumer mix

Domestic- 6202986 (93%)
Commercial- 327294 (5%)
Industrial- 25358 (0%)
Others- 135932 (2%)

Network

33 kV- 9643 cKM
11 kV- 94233 cKM
LT-
3 ph- 129007 cKM
1 ph- 198637 cKM

System metering

Feeder 33 kV- 95%
Feeder 11 kV- 87%
DTR - 38%

NATIONAL LEVEL RATINGS ON APDCL PERFORMANCE

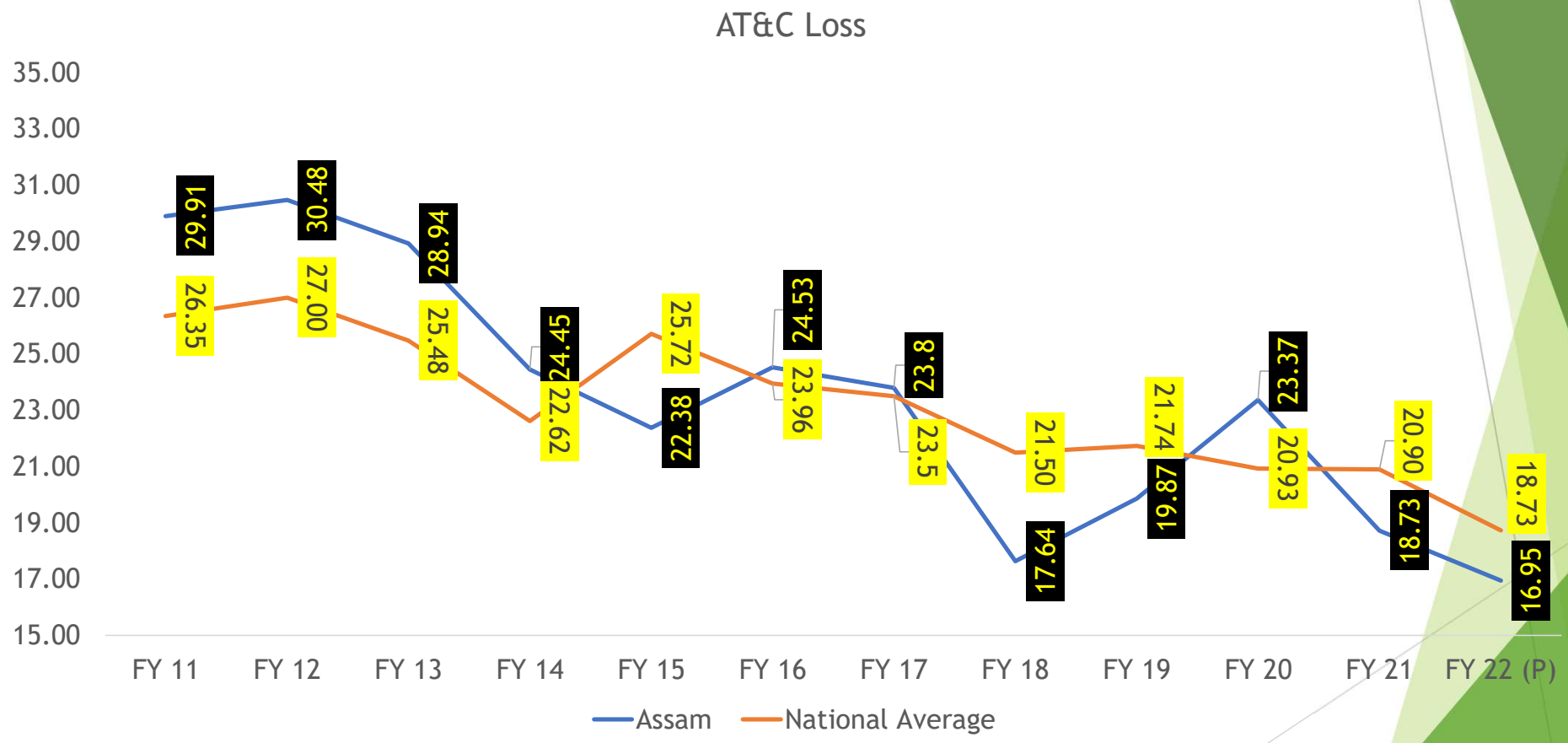
- **STATE ENERGY & CLIMATE INDEX**
  - OVERALL- 10TH OF 20 LARGE STATES
    - 4TH ON DISCOM PERFORMANCE

    [Reference Year 2019-20]
- **10TH ANNUAL INTEGRATED RATING OF DISCOMS**
  - 19TH OUT OF 52 DISCOMS

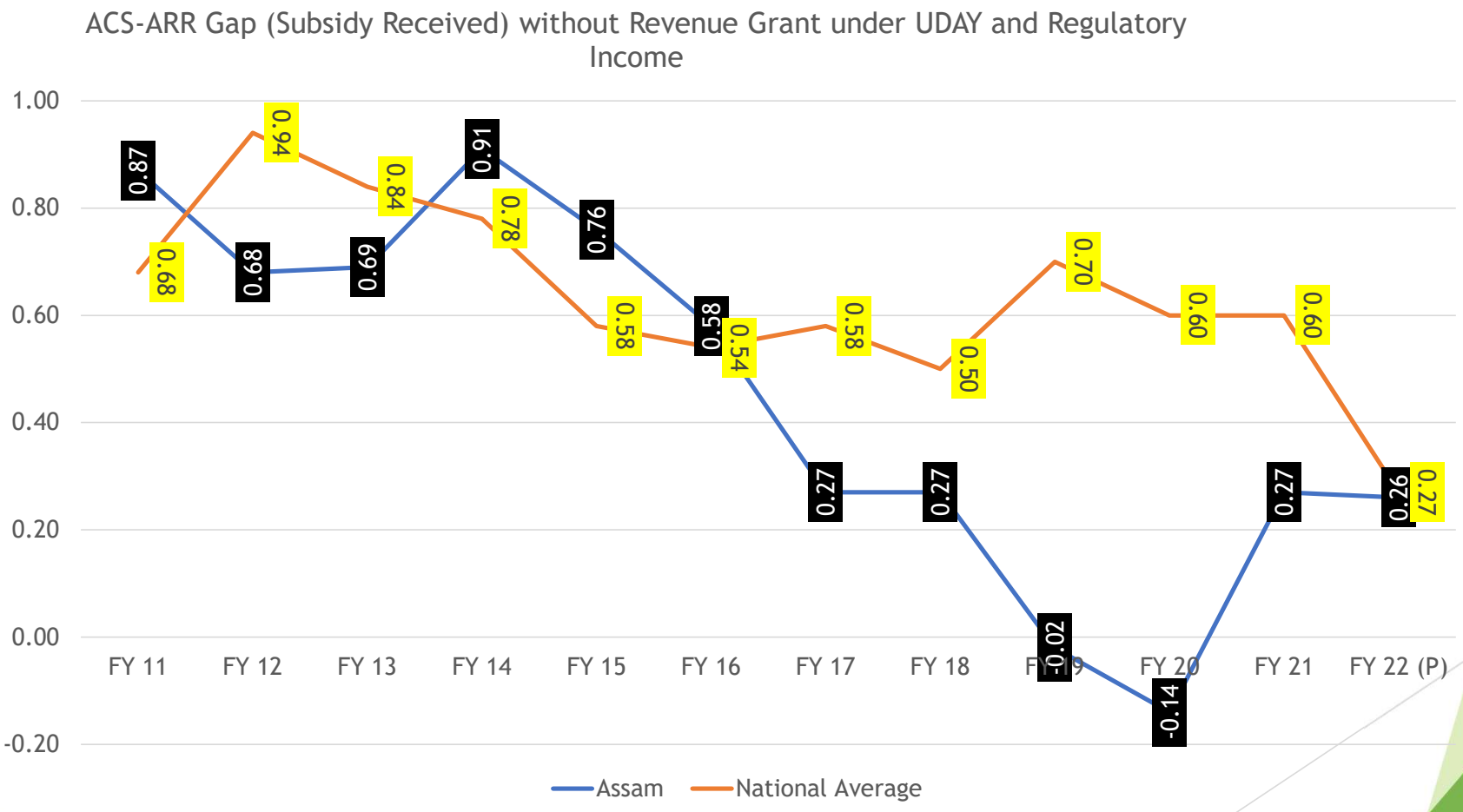
    [Reference Year 2020-21]
- **1st CONSUMER SERVICE RATING OF DISCOMS**
  - Category- C

    [Reference Year 2020-21]

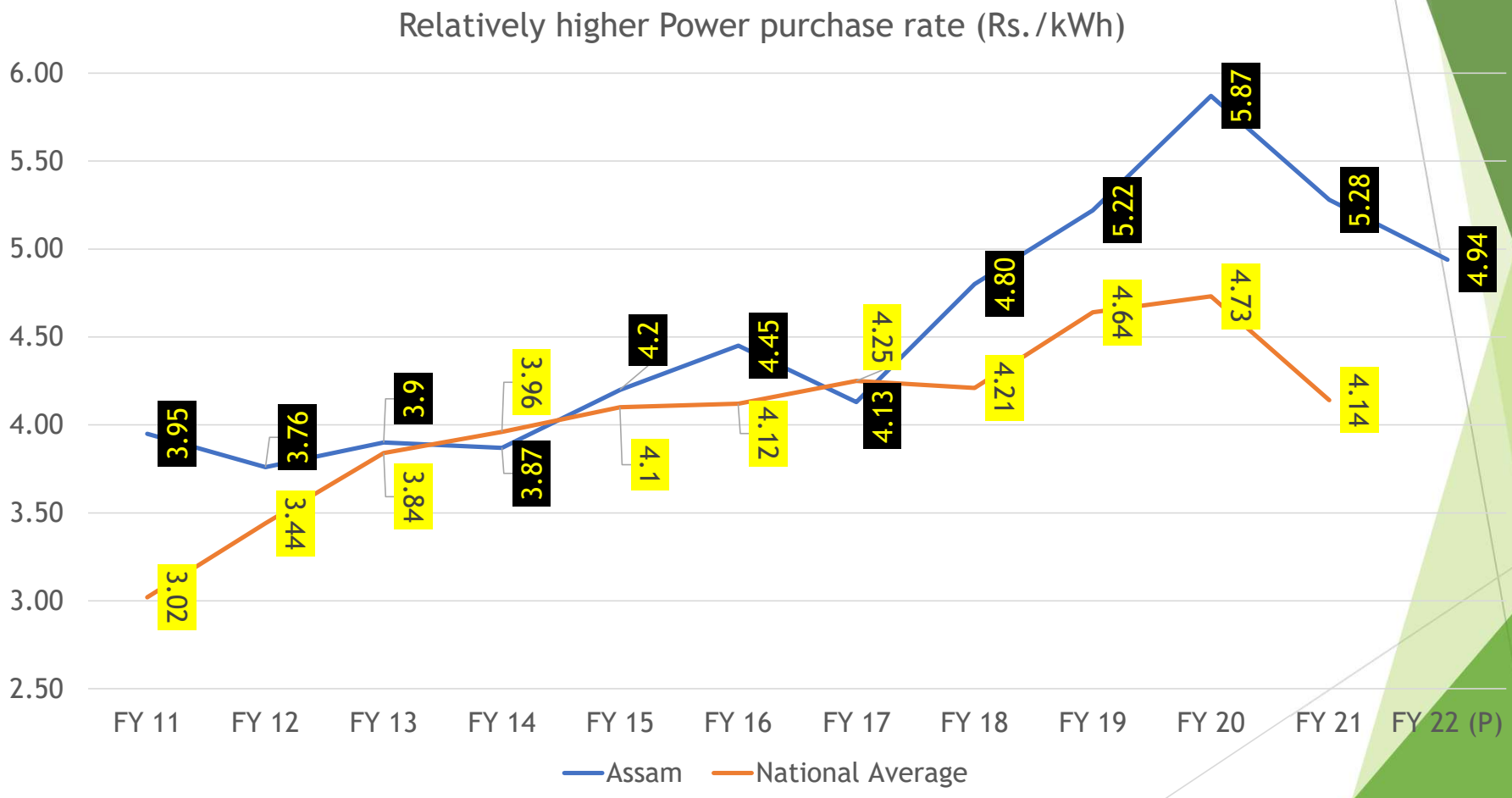
ASSAM | Operational Performance- National comparative



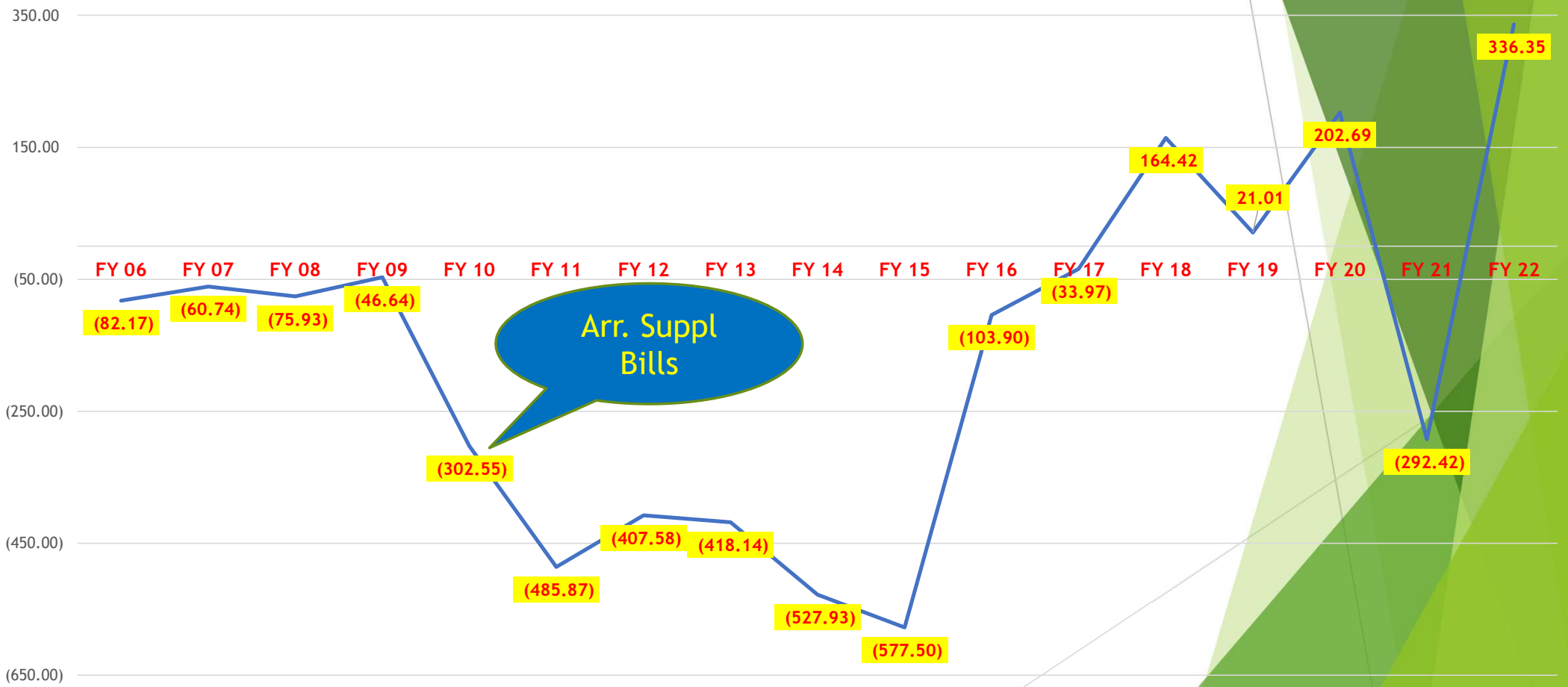
ASSAM | Operational Performance- National comparative



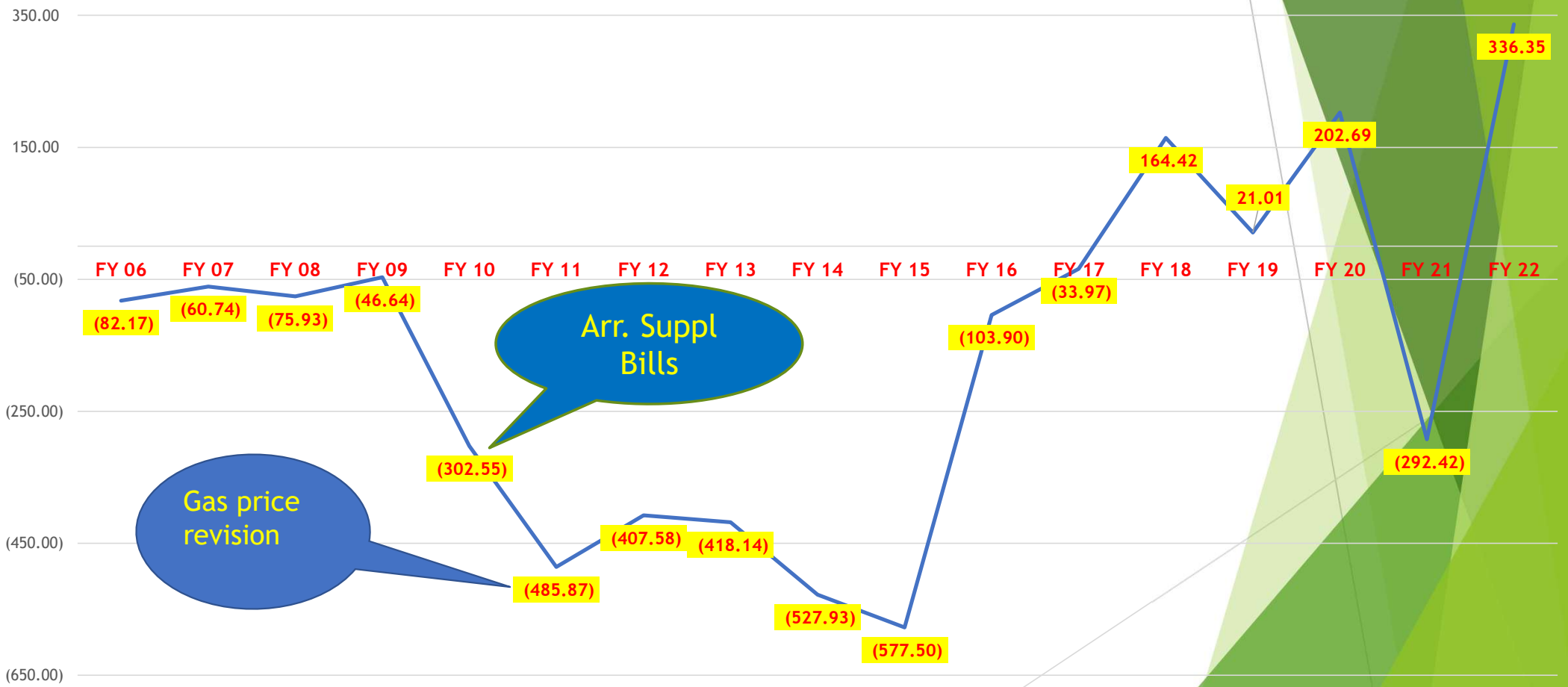
ASSAM | Operational Performance- National comparative



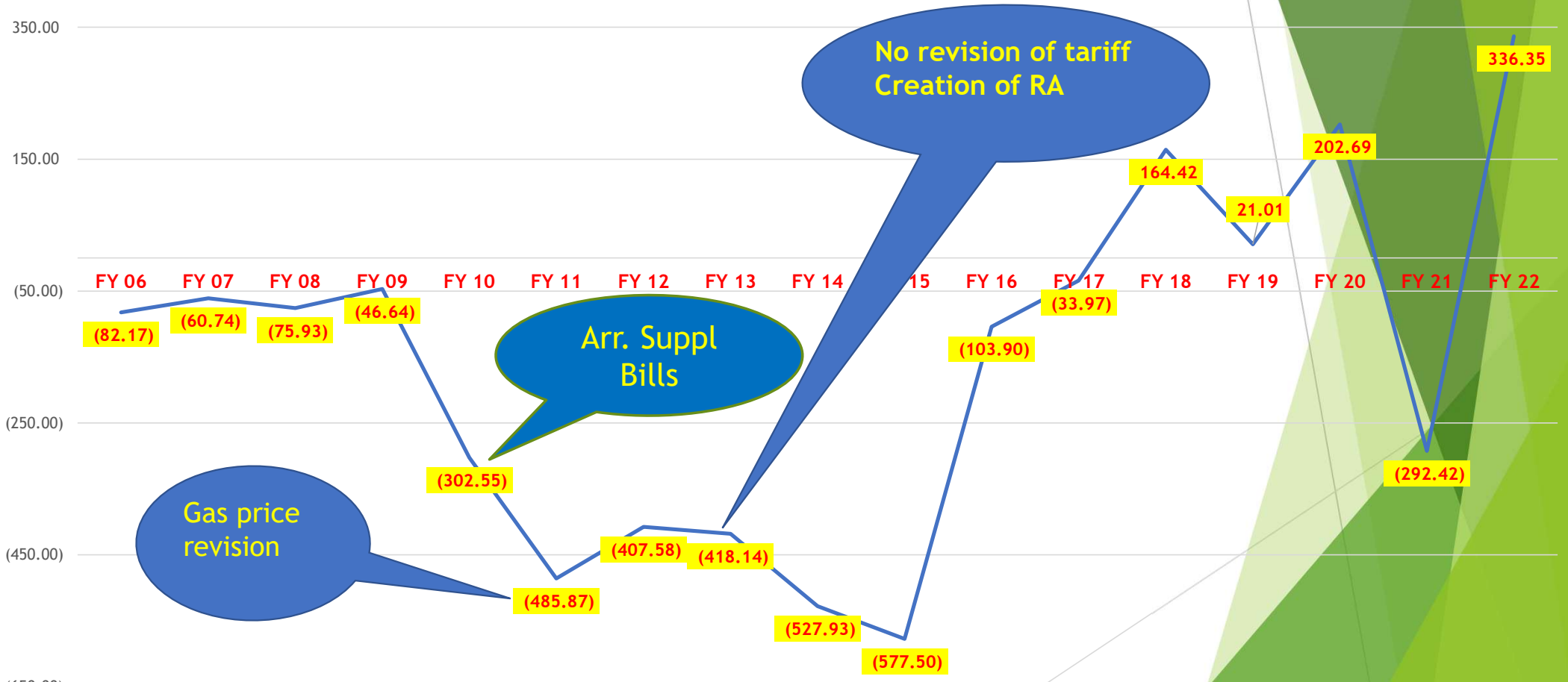
Book profit recorded (Rs. Cr.)



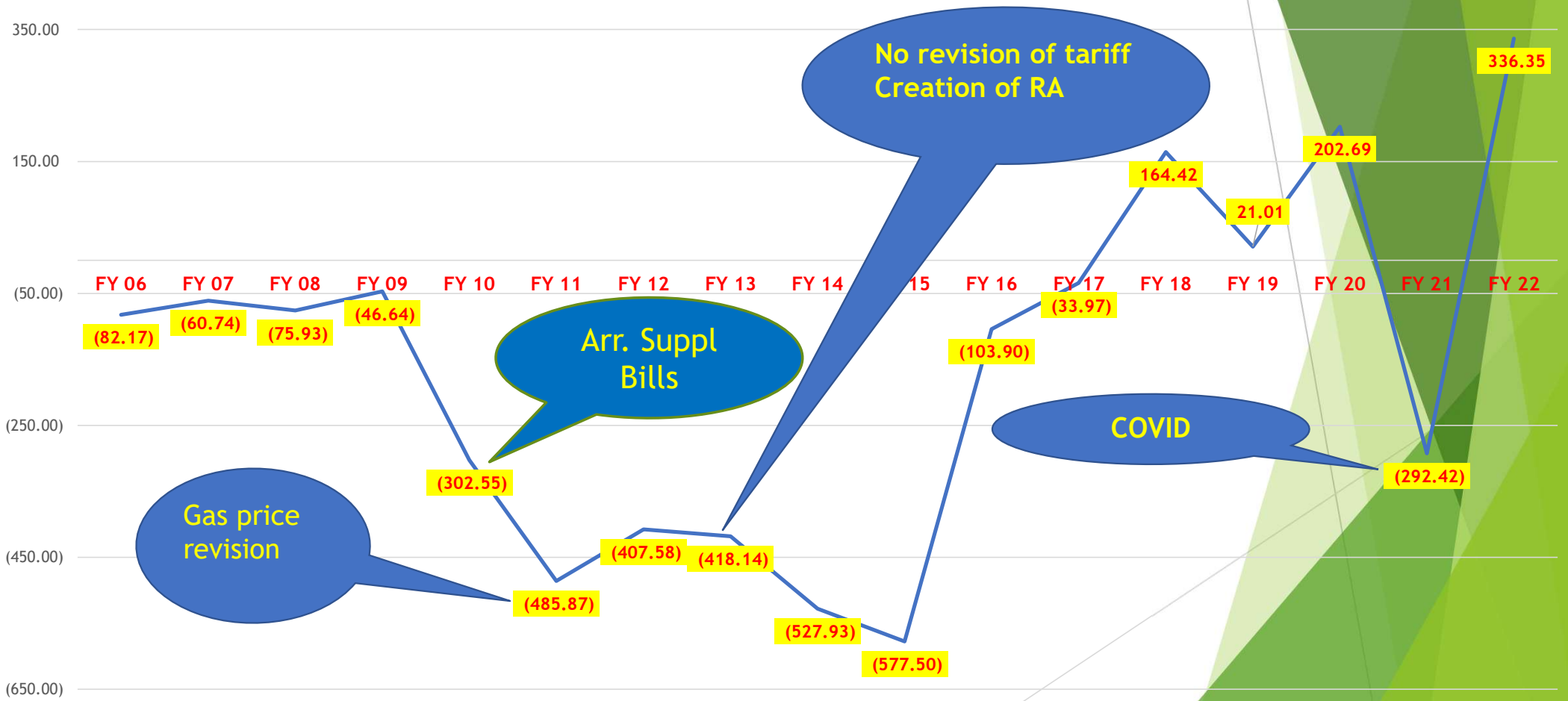
Book profit recorded (Rs. Cr.)



Book profit recorded (Rs. Cr.)



Book profit recorded (Rs. Cr.)



Issues & challenges

On AT&C loss

- Identification of loss making areas
- Infra creation
- Proper billing
- Emphasize Collection
- Stringent vigilance

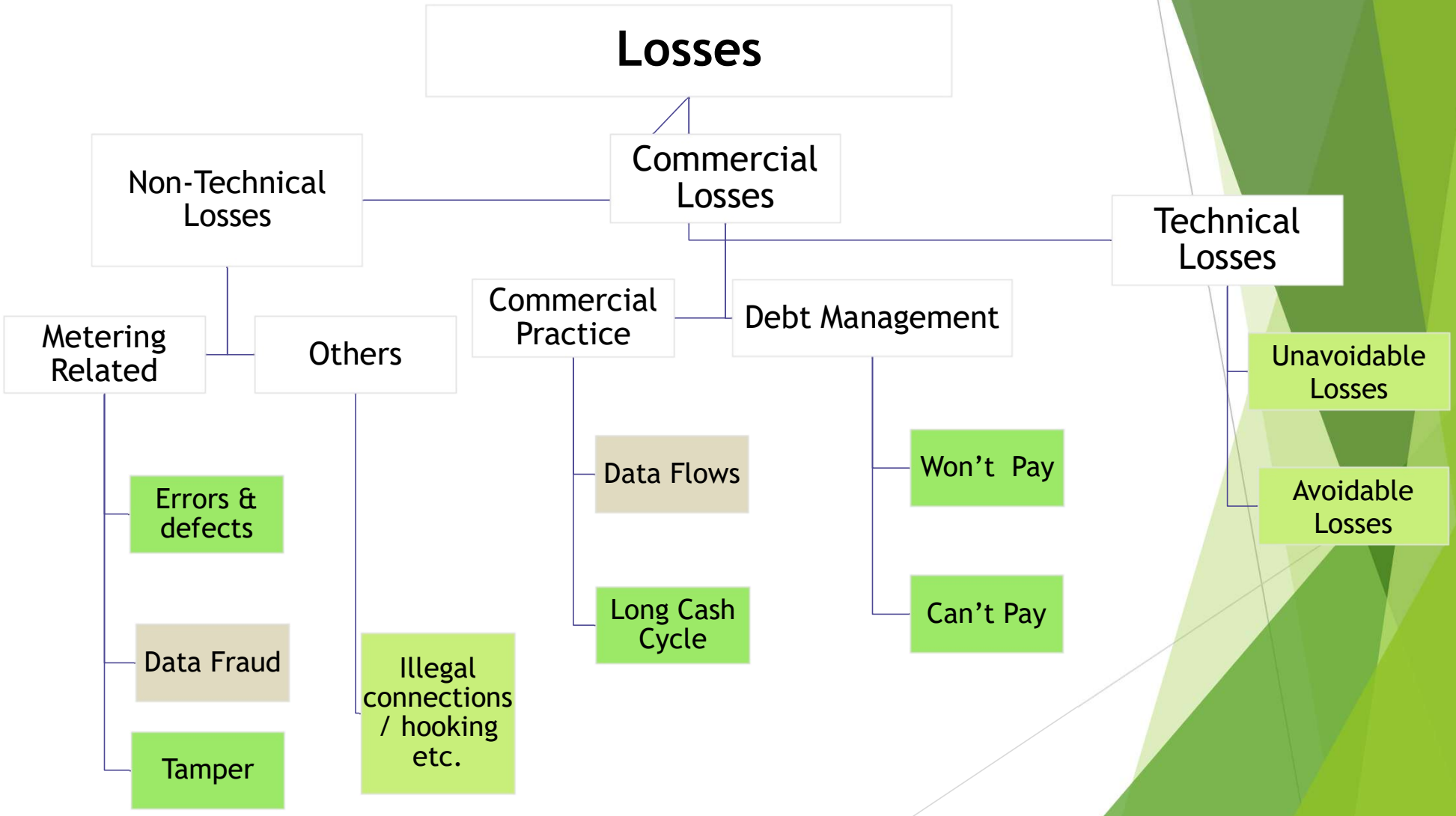
On ACS-ARR

- Optimizing PPC
- Adequate cost plus tariff
- Optimum use of resources

Policy & administrative

- Proper & timely accounting
- Timely issuance of tariff
- Stringent & unambiguous regulations

Understanding the root causes of AT&C losses



Addressing the causes of AT&C losses

- **Technical Losses**
  - **Unavoidable Losses**
    - Proper designing
  - **Avoidable Losses**
    - Improve LT:HT
    - Reduce DT Failure
    - Reduce line faults
    - Reduce voltage drops

- **Major investment Rs. 8122 Crore**

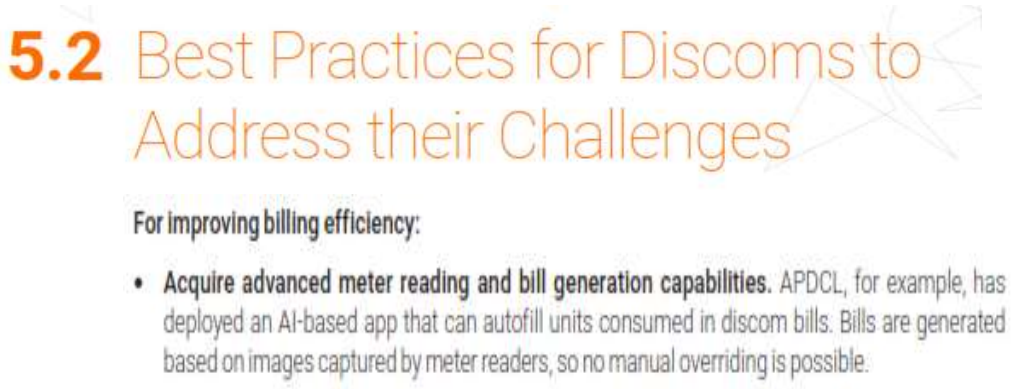
  RDSS & AIIB Funded ADSELR

  - 204 new DSS
  - HVDS- 8137 Nos.
  - 6555 CKM New HT lines

Addressing the causes of AT&C losses

Commercial Losses

- **Commercial Practice**
  - AI based Spot Billing System
  - App based Door step collection
  - Appeal from HCM
  - Distribution Franchisee
- **Debt Management**
  - Identification
  - Arrear Analysis & Planning Cell
  - One Time Settlement Scheme



5.2 Best Practices for Discoms to Address their Challenges

For improving billing efficiency:

- **Acquire advanced meter reading and bill generation capabilities.** APDCL, for example, has deployed an AI-based app that can autofill units consumed in discom bills. Bills are generated based on images captured by meter readers, so no manual overriding is possible.

Govt. of Assam has approved to take over the irrecoverable dues through budgetary support to avoid adverse impact on APDCL KPI

Addressing the causes of AT&C losses

Non-technical Losses

- **Metering Related**
  - Periodic random monitoring
  - AI based Spot Billing System
  - Smart metering & IT-OT
  - Talk back seals
  - Creation of CVES

- **Smart metering & IT-OT**
  - Already awarded- 9.72 lakh
  - Already installed- 3.84 lakh
  - Upcoming - 57 lakh under RDSS
  - GBS- **Rs. 907.67 Cr**
  - SCADA, DMS, ERP- **Rs. 231.6 Cr**

State	Smart meters
Bihar	1063623
Rajasthan	554289
Haryana	516942
Assam	384220
Delhi	258991
Madhya Pradesh	243313
Himachal Pradesh	147104
Jammu and Kashmir	105981
Punjab	88107
Andaman	75200
Puducherry	30568
Chandigarh	24213
Gujarat	23760
Karnataka	20916
Odisha	4500
Andhra Pradesh	2000
Kerala	805
Total::	**3544532**

Addressing the ACS-ARR

- **Optimizing PPC**
  - Redesigned tariff- BgTPP
  - Negotiated tariff –Pare HEP
  - Installation of RE capacities with cheaper funding.
- **Adequate cost plus tariff**
  - Amending regulation
  - No RA
  - Govt. budgetary support

Mukhya Mantri Sauro Shakti Prokolpo Capacity- 1 GW	• ADB funded- USD 434.25 million (Rs. 3200 Cr.) • Loan signing process underway
JVC with NLCIL Capacity- 1 GW	• MoU signed on 09.08.22 • JVC formalities with NITI Aayog, DIPAM etc. underway • Equity participation: 51:49 in favour of NLCIL
JVC with SGEL Capacity- 1 GW	• Process for MoU signing underway • Equity participation: 51:49 in favour of SGEL • No purchase compulsion

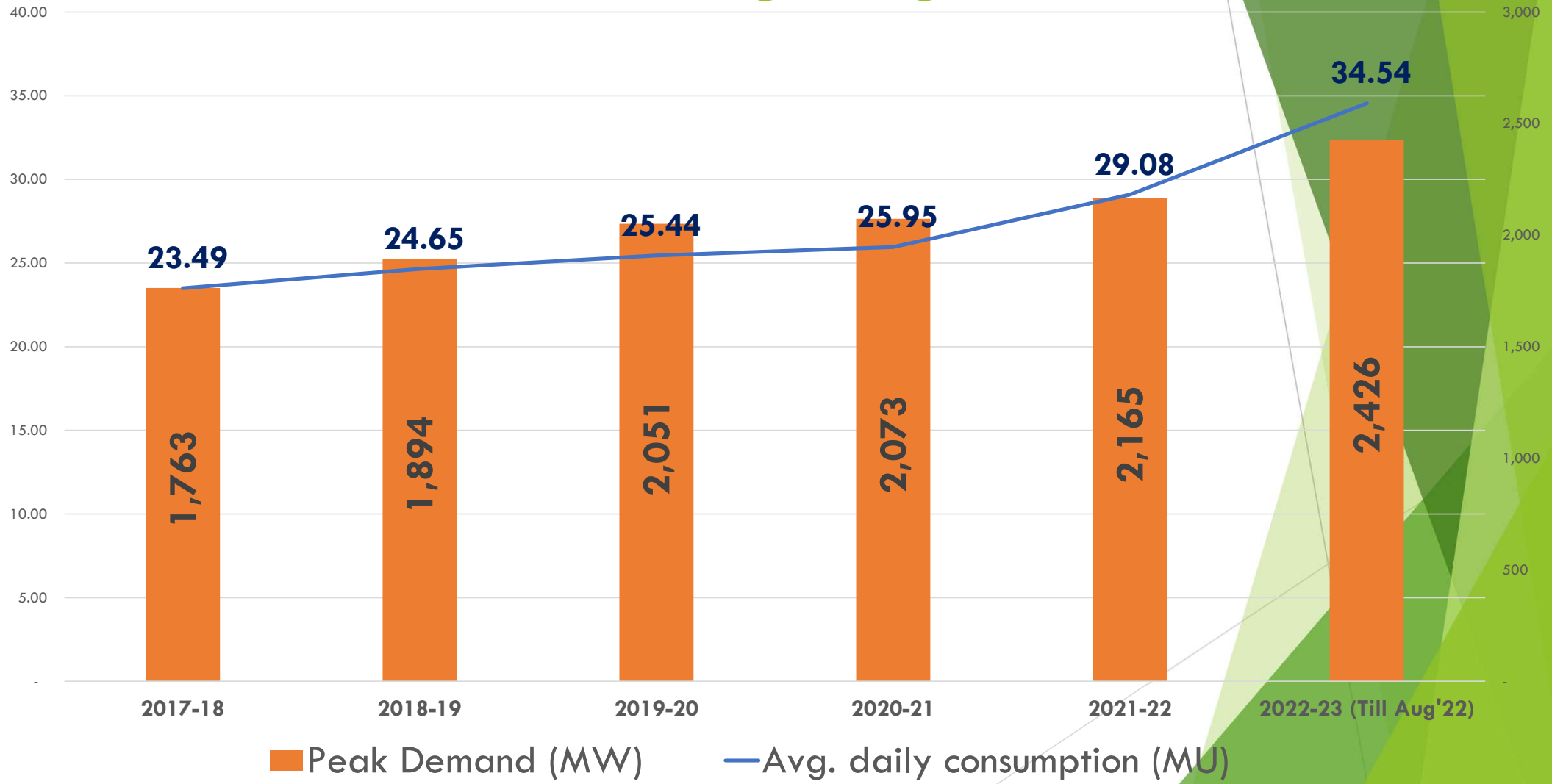
- **Optimum use of resources**
  - Prioritize payment of dues with return
  - Earned rebate-
    - Apr – Sep'21: Rs. 13.55 Cr.

      [FY 22: Rs. 38.71 Cr]
    - Apr- Sep'22: Rs. 25.85 Cr.

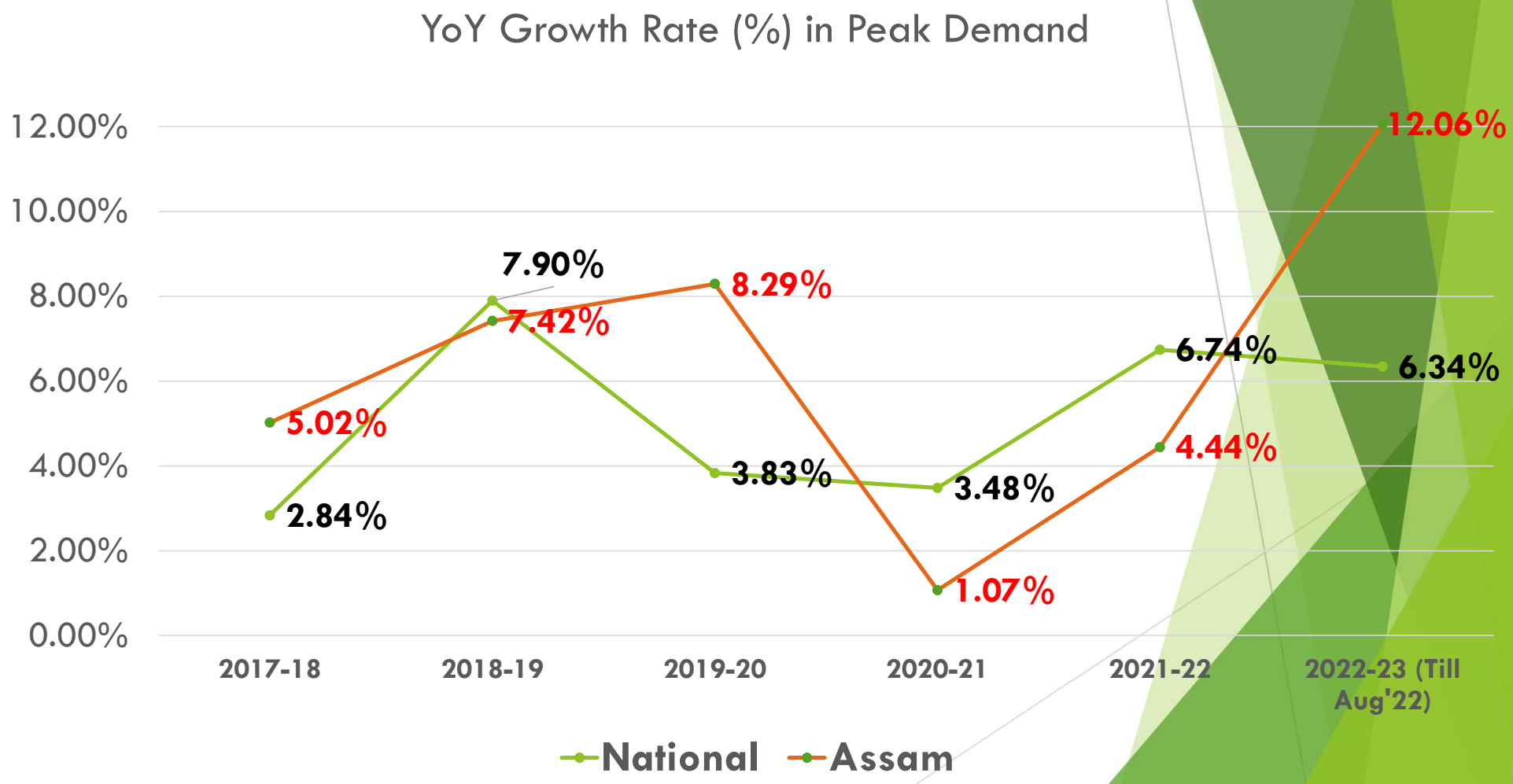
Policy & Administrative

- **Proper & timely accounting**
  - ERP based
  - Timely reporting
  - Clear cut policy
- **Stringent & unambiguous regulations**
  - Move SERC seeking needful amendments from time to time
    - Arrear recovery as Land Revenue
    - Triggering IBC
- **Timely issuance of tariff**
  - Timely filing
  - Proper filing
  - No RA
  - Cost reflective
- **Enabling policy decision**
  - Conversion of loan & grant to Equity
  - Take over of irrecoverable dues
  - Take over of losses in graded manner
  - Timely payment of Govt. dues
  - Timely payment of subsidies
  - Linkage of no due certificate with pay for Govt. employees

Accelerating the growth



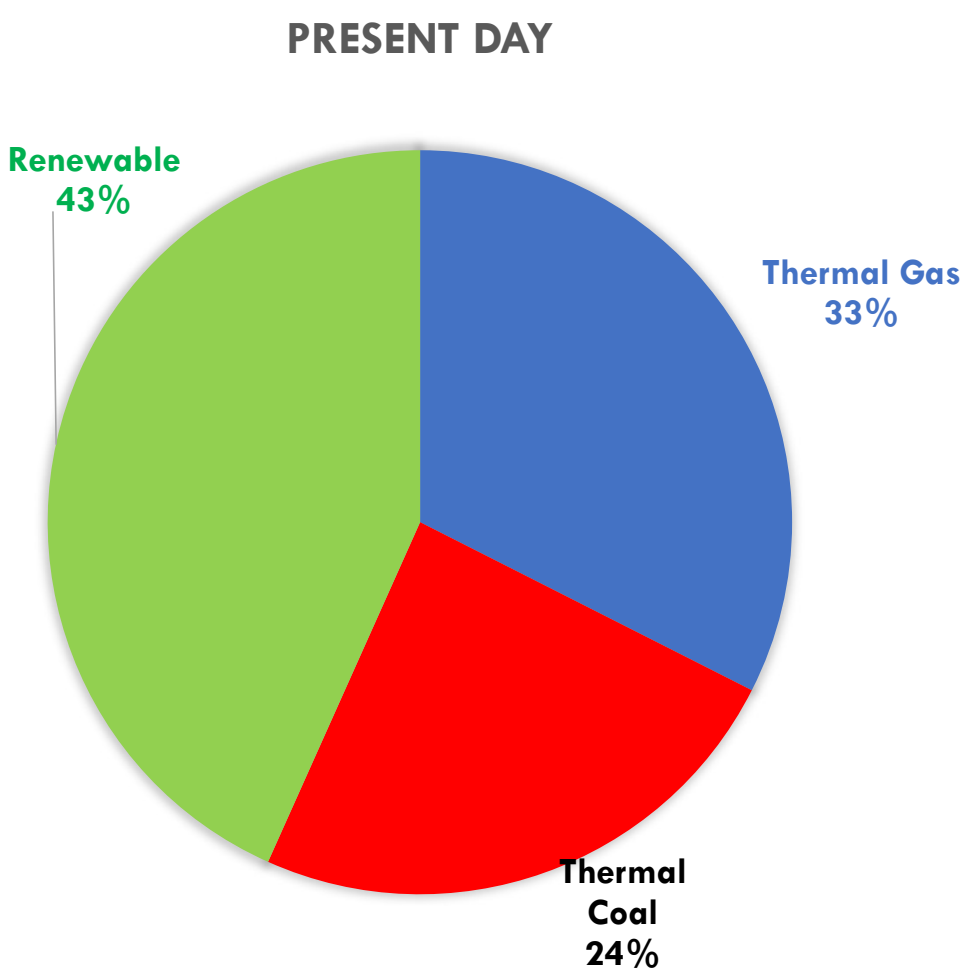
Contributing to national development

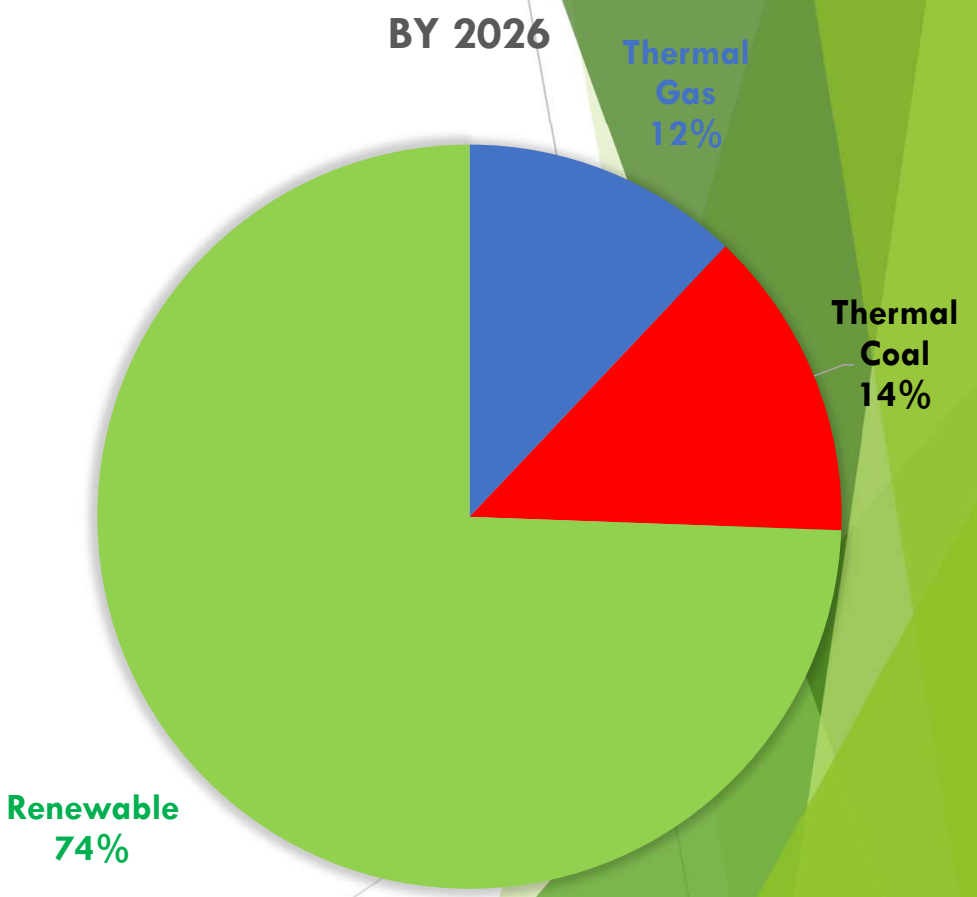


Contributing to State's development

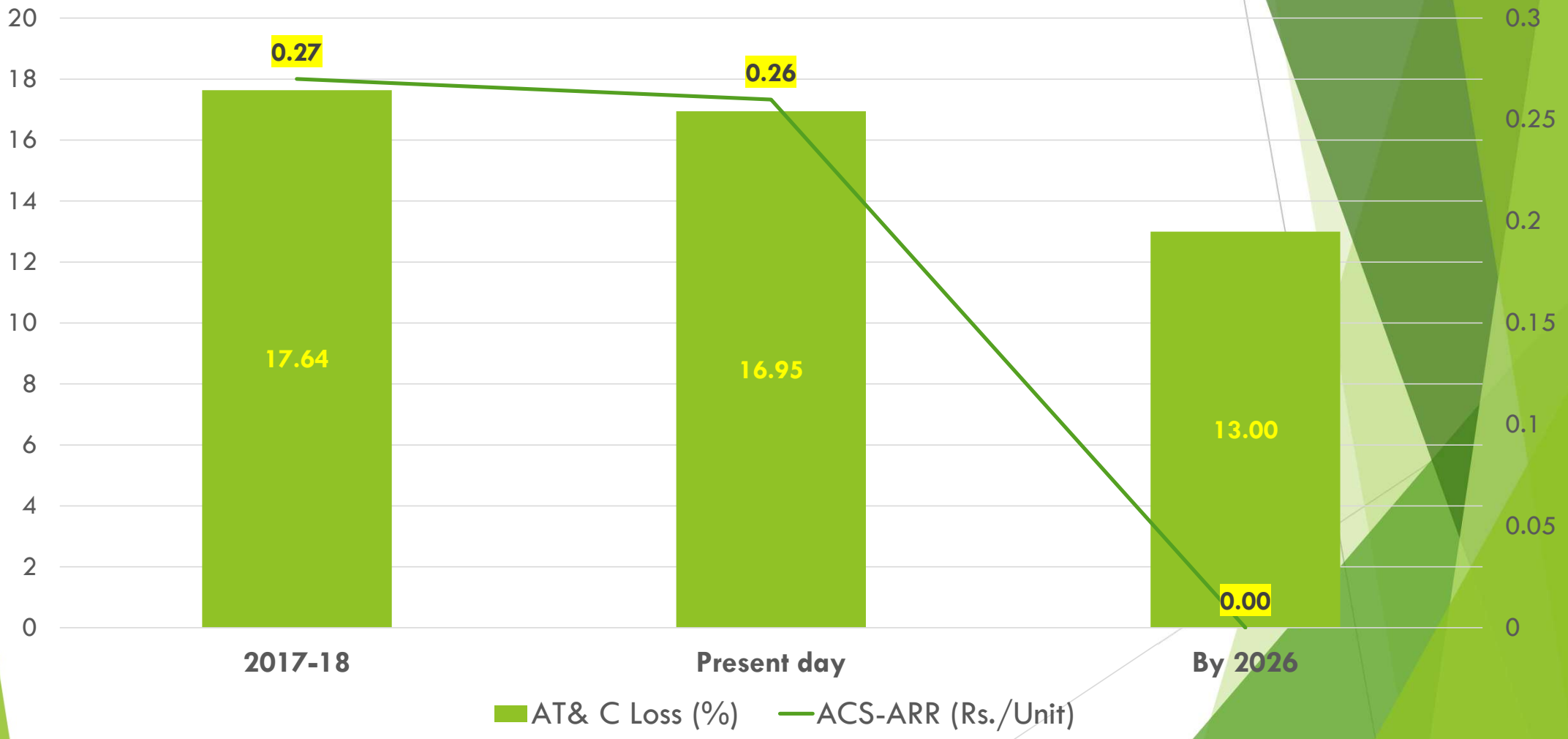
- Addl. Borrowings for State – Rs. 1886 Cr
- Meeting SDG
- Facilitating investment in the State

Marching towards green energy in line with NDC

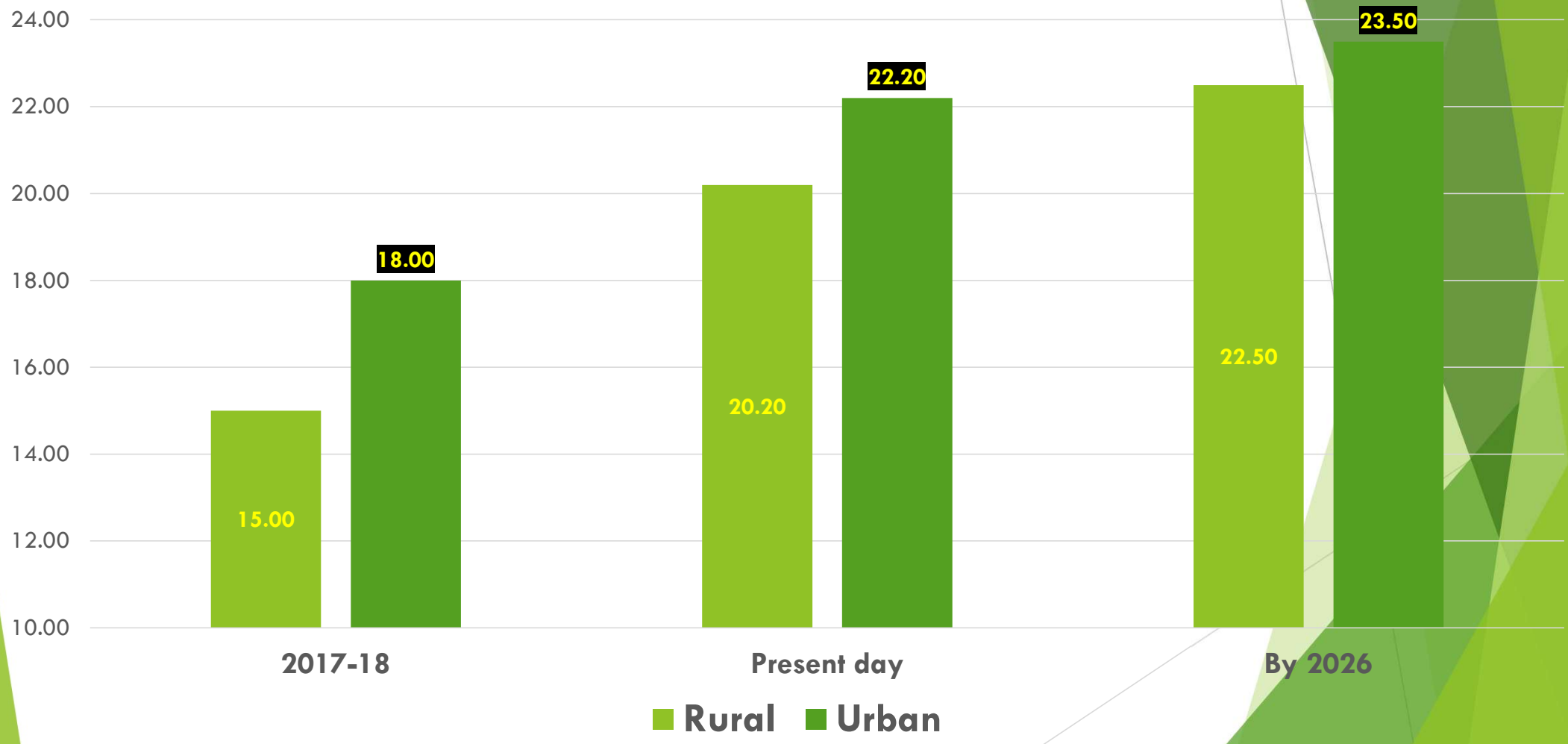




AT&C Losses and ACS-ARR gap



Hours of supply



Thank You

Govt. Notification

GOVERNMENT OF ASSAM
POWER (ELECT.) DEPARTMENT
DISPUR ::: GUWAHATI-06.

NOTIFICATION

Dated Dispur the 31st August, 2022

No.PEL.40/2022/31: Pursuant to the state Cabinet decision dated 05.07.2022, Govt. of Assam has in principle accorded approval of notifying for taking over of amount of consumer dues waived off in the process of cleansing of books of APDCL during FY 2021-22 & FY 2022-23 with the condition that APDCL will make the linking of AADHAR and EPIC compulsory while new consumer connection is provided. APDCL will further link AADHAR and EPIC even for the old connections, phase wise, to avoid ghost connections.

Subsequent to this Government Notification, APDCL will carry out the needful book adjustment in its statement of accounts and move for budgetary allocation on the basis of audited statement of accounts with detailed report of such book adjustments mentioning overall implications to Govt. of Assam.

Sd/-
(G.Talukdar, IAS)
Secretary to the Govt. of Assam,
Power (Elect.) Department.

North East Transmission Company Ltd.(NETCL)

(A JV of POWERGRID, OTPC, AEGCL & NER States)

Introduction

to

Indian Power Market

By:
Satyajit Ganguly
Managing Director, NETC

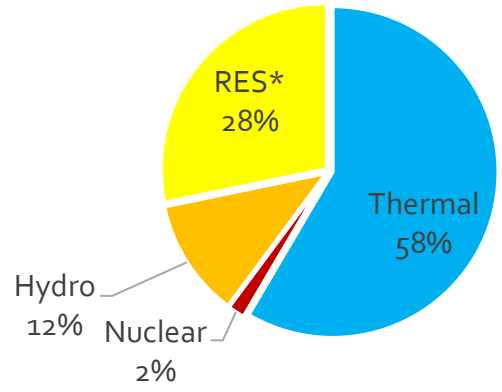
Index

Introduction-Indian Power Market

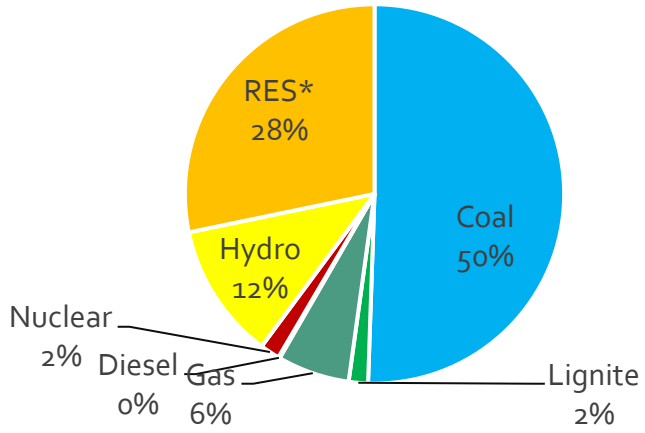
Introduction-Indian Power Market

Thermal (236065.42)			Nuclear	Hydro	Renewable	Installed Capacity
Coal (204079.50)	Lignite (6620.00)	Gas (25365.92)	6780	46850.17	114064.01	4,03,759.60

Category wise fuel mix as on June 2022



Fuel wise generation breakup as on June 2022



Indian Power Sector is largely dependent on Thermal Sector

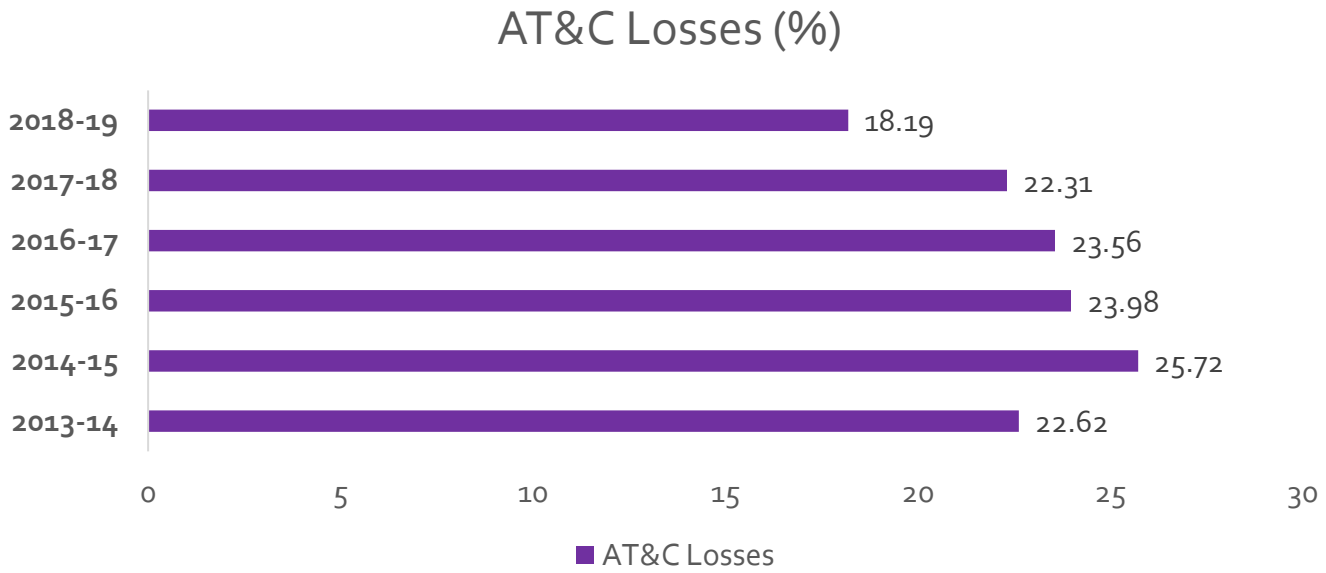
There is a significant growth predicted for Power Sector in India:

Introduction-Indian Power Market

Power Supply Position (Energy & Peak) in Jun-2022

Energy (MU)	
Supplied	Requirement
1,33,470	1,34,215

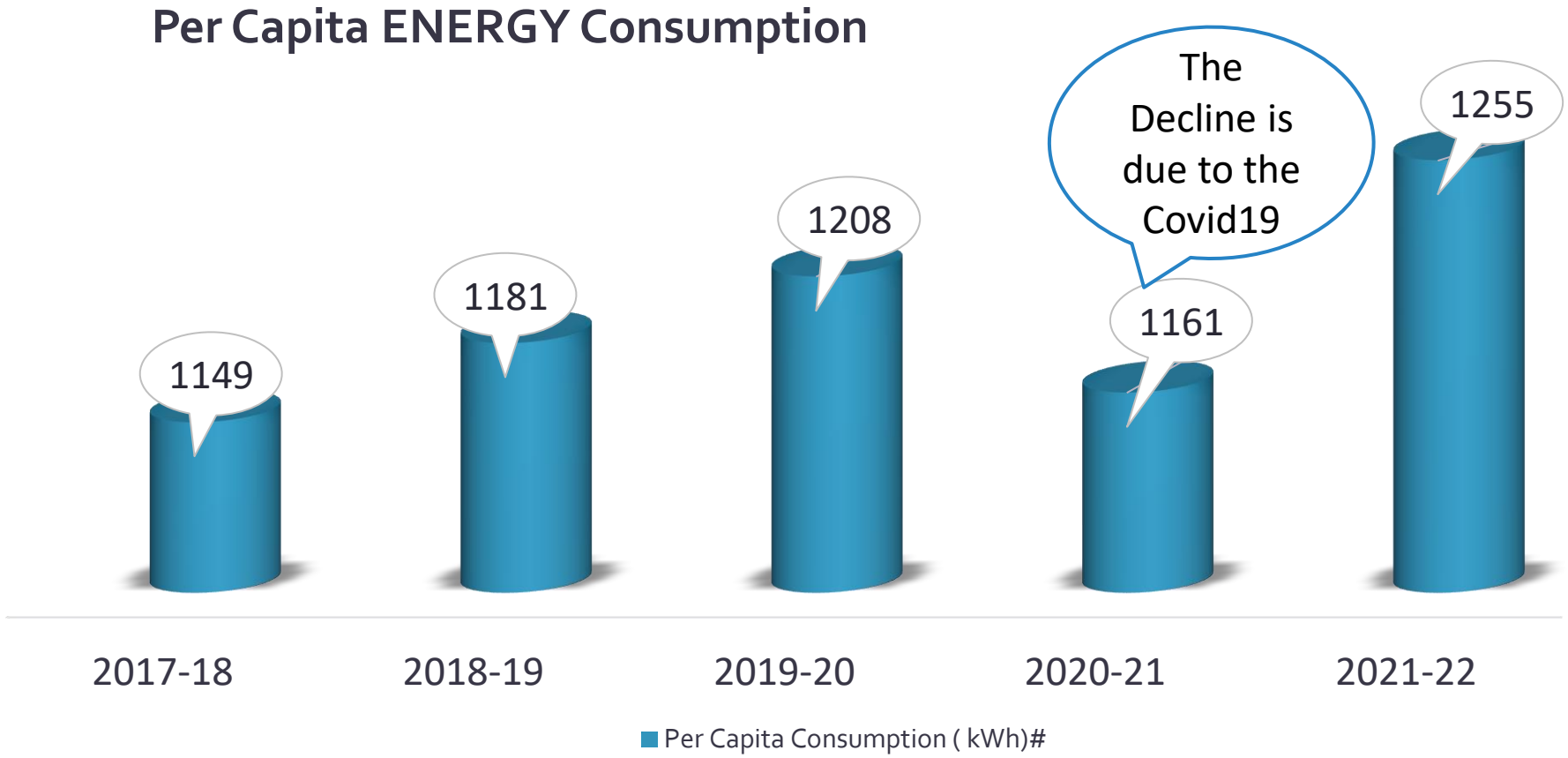
Power (MW)	
Peak Met	Peak Demand
2,11,856	2,12,646



* Provisional

Note: The progress shown above from FY17 and FY18 is based on data provided by PFC on the basis of audited/certified annual accounts of Utilities and progress of FY19 is based on provisional / unaudited data entered by States /DISCOMs on UDAY portal during respective years/quarters, which may vary from the year-end audited figures. The portal dynamically captures data as and when uploaded by States.

Introduction-Indian Power Market



(GrossGen.+ Net Import) /Mid-year population)

Introduction-Indian Power Market

Problems affecting the power sector

Power Installed Capacity = 4,03,759 MW

Power Demand catered = 2,12,646 MW

Conversion Efficiency < 52%

Reasons for demand supply mismatch

Thermal	• Shortage of Fuel viz. Coal, Natural Gas • Transmission bottleneck • Demand suppression by DISCOMS due to poor financial health
Hydro	• R&R and environment issues with new projects • Seasonal; Caters only to peak demand • Less storage capacity of existing hydro projects
RES	• Unreliable- heavily dependent on seasonal factors; • Poses problem in Grid Management

Introduction-Indian Power Market

Opportunities in Power Sector

- Every 1% growth in electricity demand results in 1.3% growth in economy.
- To achieve a growth rate of 8% corresponding growth rate of 6% in electricity sector is required.
- Power Sector forms one of the strongest (and the weakest) links to building the GDP of any country.
- Electricity is also the most affordable, safe, multipurpose and easily transportable form of energy across political and geographical boundaries.
- Major Sources of power generation in India, FY 2015

Introduction-Indian Power Market

- All India Thermal PLF Sector-wise (Excluding Gas Based Power Plants) for Jun-2022

Sector	%PLF of Thermal Power Plants (excluding gas based power plants)
Central	78.93
State	66.53
Private Sector IPP	59.51
Private Sector UTL.	77.48
All India	68.16

Introduction-Indian Power Market

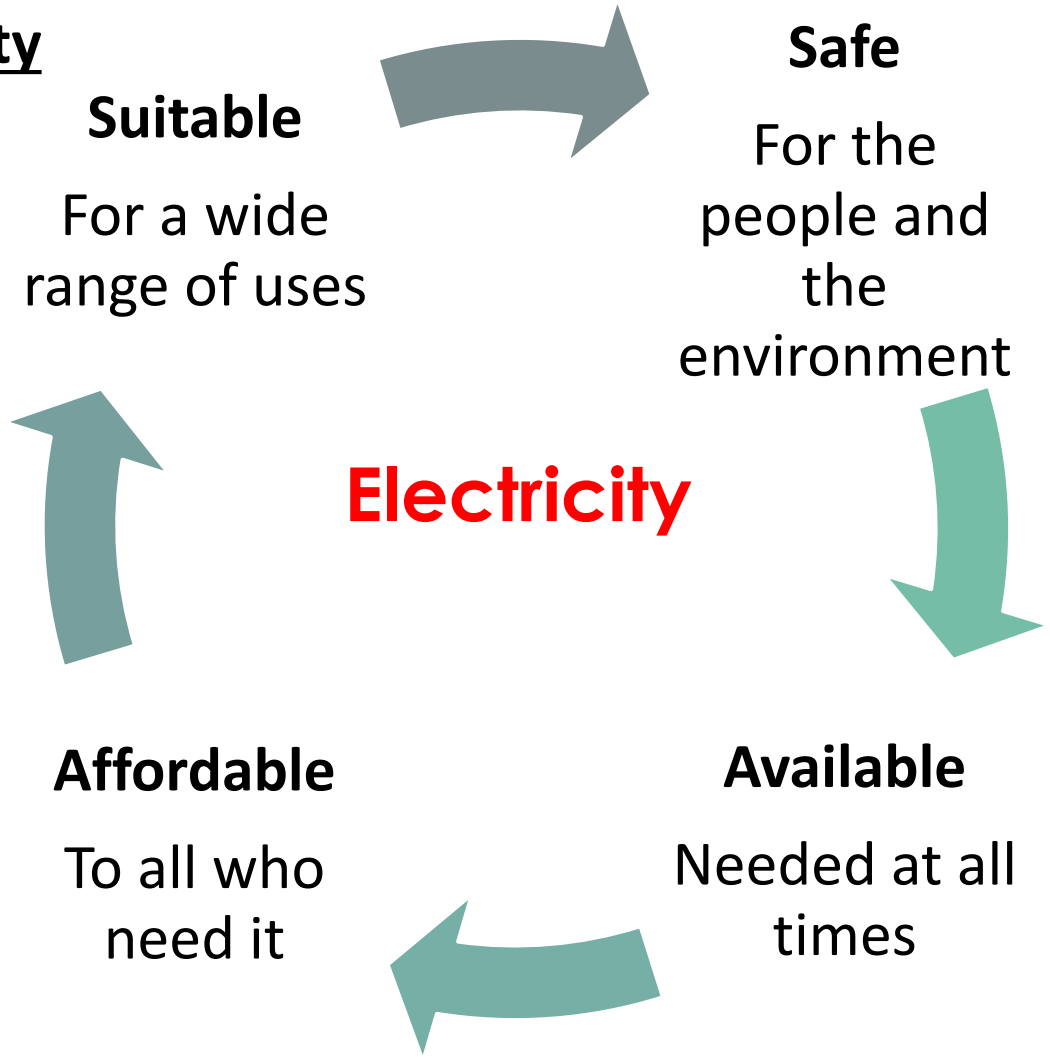
- Average cost of Power & Average Realisation

Year	Average cost of supply(ACS) (paise/unit)	Average Revenue Realization(paise/unit)	Gap ACS-ARR (on subsidy received basis) paise/unit
2013-14	519.03	441.31	77.72
2014-15	520.57	462.11	58.46
2015-16	530.57	482.55	48.02
2016-17	538.01	500.78	37.23
2017-18	550.06	519.81	30.26
2018-19	599.93	548.36	51.57

Electricity Market: Definition & Benefits

Electricity Market: Definition & Benefits

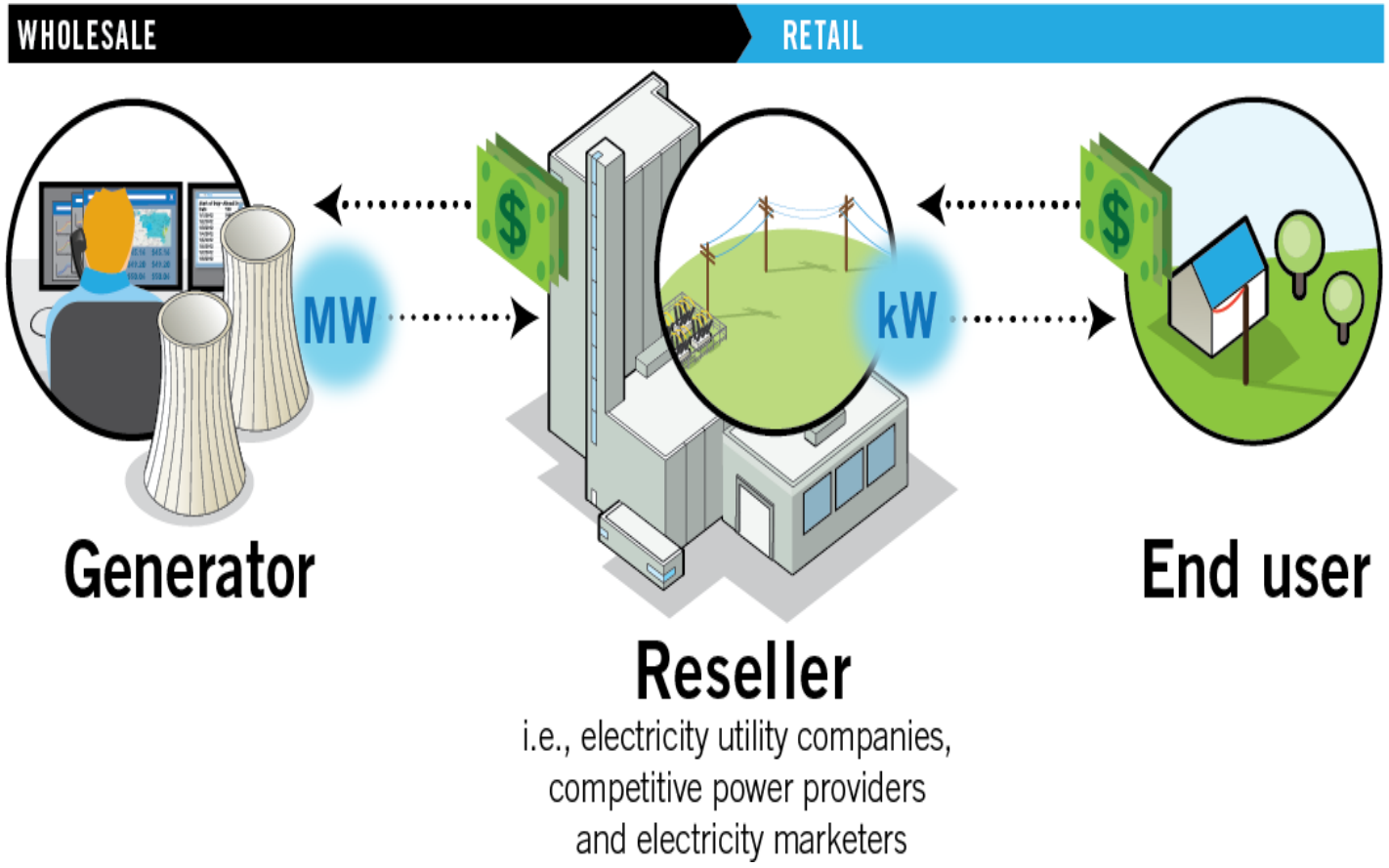
Need to Focus on Electricity



Electricity Market: Definition & Benefits

Electricity Market

- Electricity (both power and energy) is a commodity;
- Capable of being bought, sold, and traded
- **Electricity market** is a system enabling purchases, through bids to buy; sales, through offers to sell; and short-term trades
- Bids and offers use supply and demand principles to set the price.



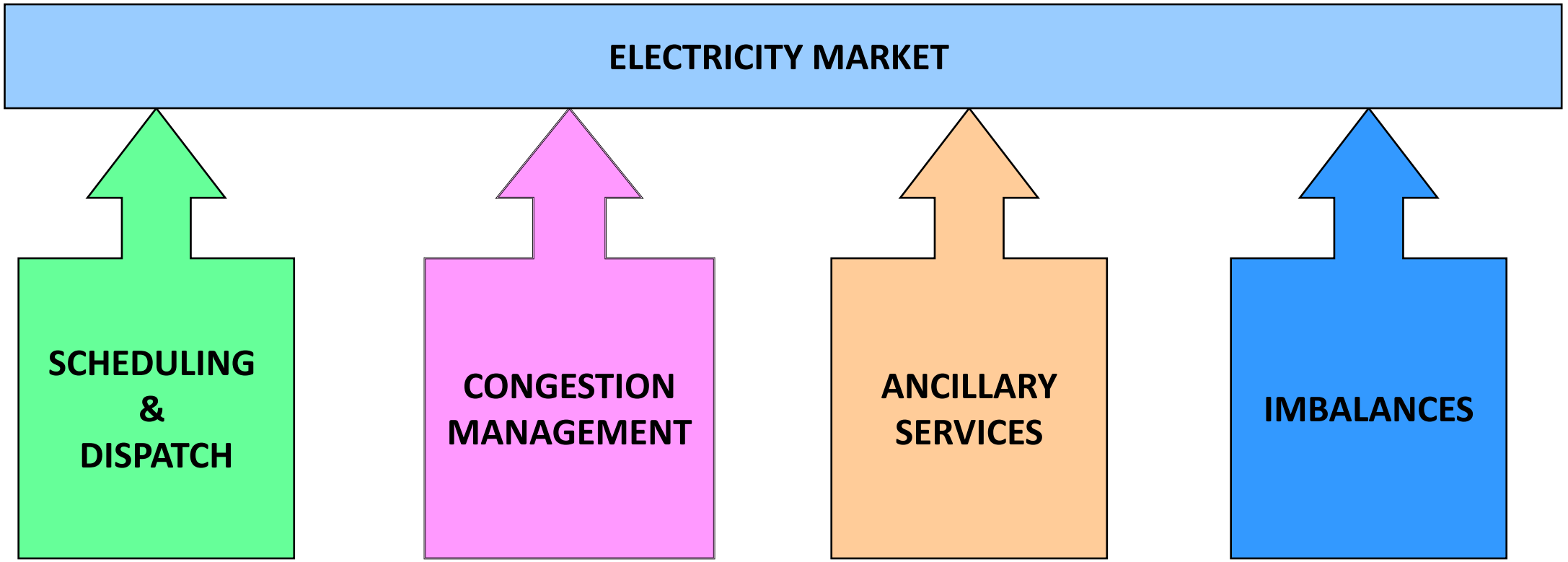
Electricity Market: Definition & Benefits

Enablers of Electricity Market

- **Payment security mechanism**
- **Risk Mitigation mechanism:** Reduces Liquidity & Business Risk
- **Price acts as signal for new investments:** Merchant Power and private sector investment
- **Match short-term surplus with demand variation:** Optimal asset utilization
- **Latent generation capacity:** Captive power plants can participate

Pillars of Market Design

Pillars of Market Design



"Making Competition Work in Electricity",
Sally Hunt

Pillars of Market Design

Scheduling & Dispatch

- Electricity travels at the speed of light
- Traders schedule forward contracts with each other
- But energy is mingled together in real time.
- System Operator co-ordinates with generators
  - when to start up/stop
  - when to increase /decrease output,
- Known as scheduling (in advance) and dispatching (in real time).

How does the system operator decide who should generate at any time?

How are forward contracts tied to scheduling?

How should financial settlements be tied to physical operations?

Pillars of Market Design

Congestion Management

- Electricity is transported on transmission wires networked in a complex grid.
- One cannot tell electricity where to go, which transmission line to follow
- System operator to ensure that total electricity flows will not overload any line
- **Congestion Management**: Whenever any line reaches its capacity, System operator tells producer(s) to back down/ generate.

Who does he tell?

How does he get generators to agree to back down or bring up their plants?

Pillars of Market Design

Ancillary Services

- **Ancillary Services**: Necessary to make power system work, such as operating reserves, reactive power etc.
- Mostly, ancillary services are produced by generating plant.
- Problem:
  - Production of ancillary services linked to energy production
  - Normally only produced and sold when the energy price is high enough

How does System Operator procure these ancillary services?

What does he pay?

What does he charge the users?

Pillars of Market Design

Imbalances

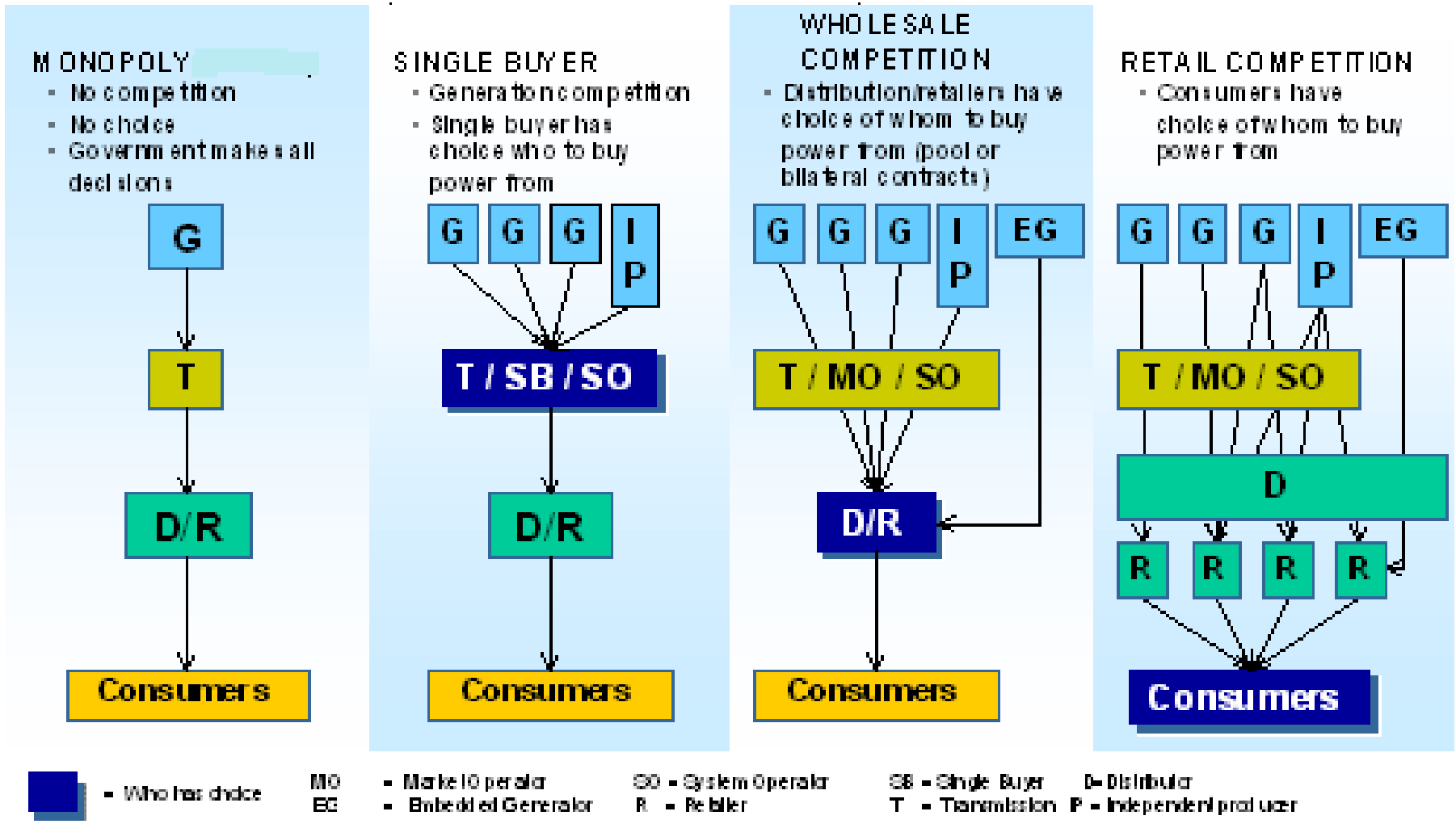
- Forward contracts between buyers and sellers make up bulk of deliveries (worldwide) where traders have a choice.
- **Imbalance**: Difference between amounts contracted and amounts actually sent out by the supplier and consumed by the customer in real time.
- Responsibility of System Operator
  - To make up any shortfalls or absorb any excesses
  - Deal with the imbalances quickly and efficiently

System operator buys and sells imbalances.

The questions are: from whom, to whom, and at what price?

Electricity Market Models

Electricity Market Models



Electricity Market Models

- **Monopoly:** One entity may have responsibility for all functions of power system management and operation, including: generation, transmission, distribution and retail to End-users.
- **Single Buyer Model:** Generation Companies competes to sell electricity to Single Buyer (SB).
- **Wholesale Model:** Generation Companies competes to sell electricity to Distribution Companies, Distribution Companies competes to buy electricity from Generation Companies and sell it to End-users.
- **Retail Model:** This is the highest level of competition electricity market, in which, electricity is considered as the normal commodity, all customers can choose their supplier.

Only these can be termed as "Electricity Market" in real sense

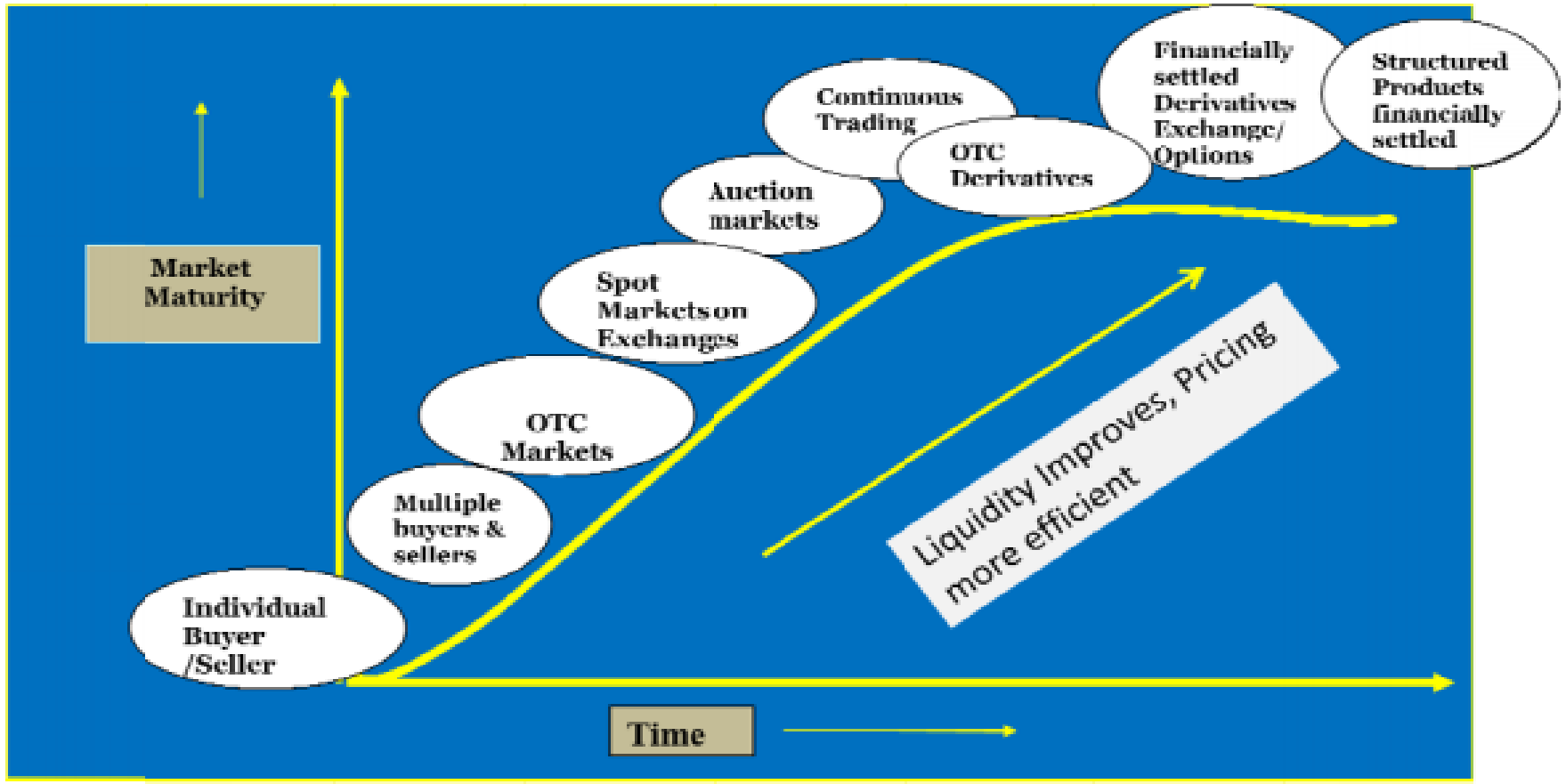
Electricity Market Models

- **Zonal Pricing**
  - Sufficient Transmission Network in area
  - Borders of price area follow physical limits of networks
- **Nodal Pricing**
  - Scarcity of Transmission Capacity

Transmission network adapts to the market	Market adapts to the transmission network
Zonal pricing	Nodal pricing
Calc. of the transm. system use ⇅ Electricity price calculation	Node price= energy, congestion fee and losses
Single or few area price(s) / Risk management: changes in the price of electricity	Price for each node of the network / Risk management: network congestion between the nodes
Ex post market surveillance	Ex ante market surveillance

Electricity Market Models

Maturity of Electricity Market: S- Curve

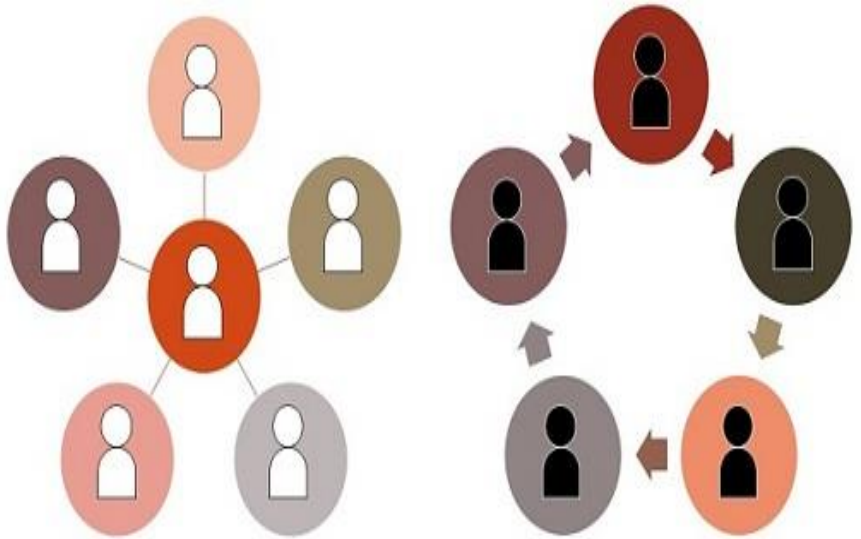


- *In matured markets all these types of markets exist*
- *Interplay between markets improves price discovery*

Electricity Market Models

Markets

- **Decentralized**
  - Delay and Search costs
  - Goods (and services) may not be standard
  - Liquidity may not be very high
  - Prices may vary (Inefficient price discovery)
- **Centralized**
  - Suitable for standard goods (and services)
  - Lower transaction costs
  - Improved Price Discovery



Electricity Market Models

Counterparty Risk

- Members (primarily) responsible for counterparty risks
- Deal in exchange only through a member of the exchange
- Exchanges control exposure of their members & clients through a system of margins and guarantees

Electricity Market Models

Futures and Options

- Futures are contracts through which a buyer or seller *buys or sells* any good (or asset) at a predetermined price in future
- Options are contracts which give a buyer or seller *the right to buy* (call) *or sell* (put) any good (or asset) at a predetermined price in future

Electricity Market Models

Spot and Other Financial Markets

- Spot markets are meant for buying or selling of the underlying good (or asset) and accordingly trades are settled through delivery
- Markets like futures and options are primarily meant for price risk reallocation and can be settled either by cash or delivery, if the positions are not netted out
- Some contracts (futures and options) are explicitly for cash settlement and some are for physical delivery
- Cash settled contracts are settled on the basis of spot price prevailing at the time of expiry of futures or options contract.
- For physical delivery, location and other modalities are specified

Electricity Market Models

Auction Markets

- Buyers and Seller compete by offering prices either through limit order or market order. Orders, therefore, contain price and quantity information
- The market protocol stacks the orders and finds out the MCP (market clearing price) such that demand= supply (at that price).
- Degree of competition and elasticity of demand and supply determines price behaviour.

Power Exchanges

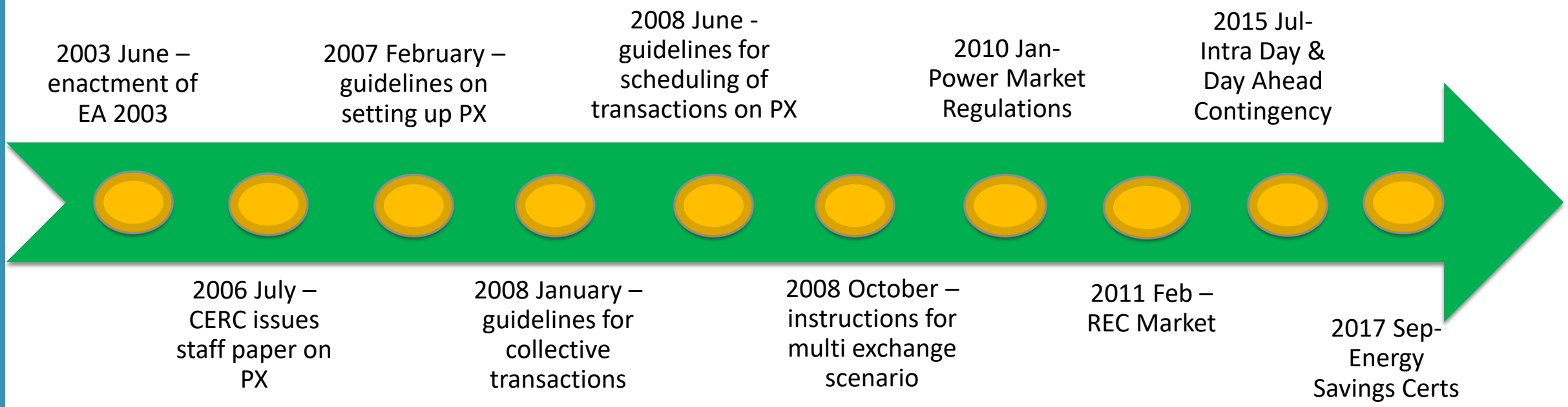
Power Exchanges

Framework for Power Exchanges

- In 2006, CERC floated paper on *"Developing a Common Platform for Electricity Trading"*
- CERC passed orders setting guidelines for establishment and management of PXs:
  - De-mutualized form of organisation
  - Reliable, effective and impartial management
  - Ring-fencing between ownership, management and participation
  - Investment support from the investors including institutional investors
  - Transparency in operation and decision-making
  - Computerised trading and clearing system
  - Efficient financial settlement and guarantee system
  - Effective trade information dissemination system
- Two Power Exchanges in operation from 2008
  - Indian Energy Exchange
  - Power Exchange of India Limited

Power Exchanges

Power Exchanges Timeline



Power Exchanges

Benefits of Power Exchanges

- Trading is done in efficient, transparent and equitable manner
- Exchange is the central counter-party for all transactions
  - Risk management for all entities
  - Overcomes issues of credit-worthiness of State Utilities
- Increasing the liquidity of transactions
  - Standardization of electricity as a tradable product
  - Introduction of products of longer term and hedging instruments
- Increasing the depth of participants
  - Helping Captive Generation Capacities to bring their surplus on board
  - Providing a platform to Independent Power Producers for their merchant sales
  - Providing large load consumers access to “on-demand electricity”

Power Exchanges

Market Segment

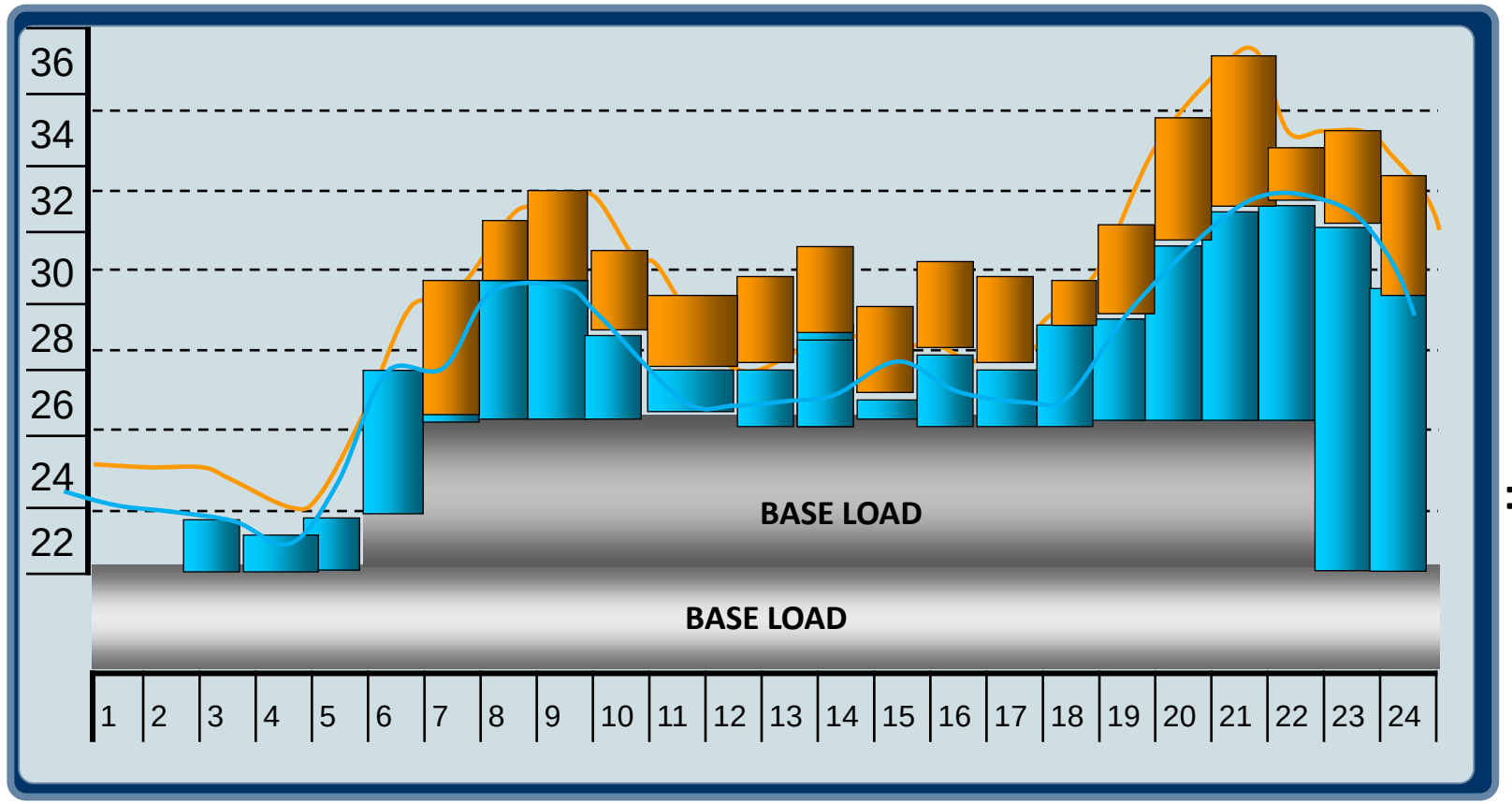
Day-Ahead Market since June,08	• *Delivery for next day* • *Price discovery: Closed , Double-sided Auction*	Auction
Intraday Market & Day-Ahead Contingency Round the clock since Jul'15	• *Intraday: For Delivery within the same day* • *Day Ahead Contingency: Another window for next day* • *Gate closure : 3 hours*	Continuous
Term-Ahead Contracts since Sep,09	• *For delivery up to 11 days* • *Daily Contracts, Weekly Contracts*	Continuous, Auction
Renewable Energy Certificates since Feb,11	• ***Green Attributes as Certificates*** • ***Sellers :*** *RE generators not under feed in tariffs* • ***Buyers:*** *Obligated entities; 1MWh equivalent to 1 REC*	Auction
Energy Saving Certificates since 27 Sep'17	• *1 Ecert= 1 Mtoe(Metric Tonne Oil Equivalent)* • *Trading Session on every Tuesday of the Week* • *Trading time 1300 hrs to 1500 hrs*	Auction

Source: IEX

POWER Exchanges

Demand Management

For illustrative purposes only



Base Load – Managed through Long Term PPA's

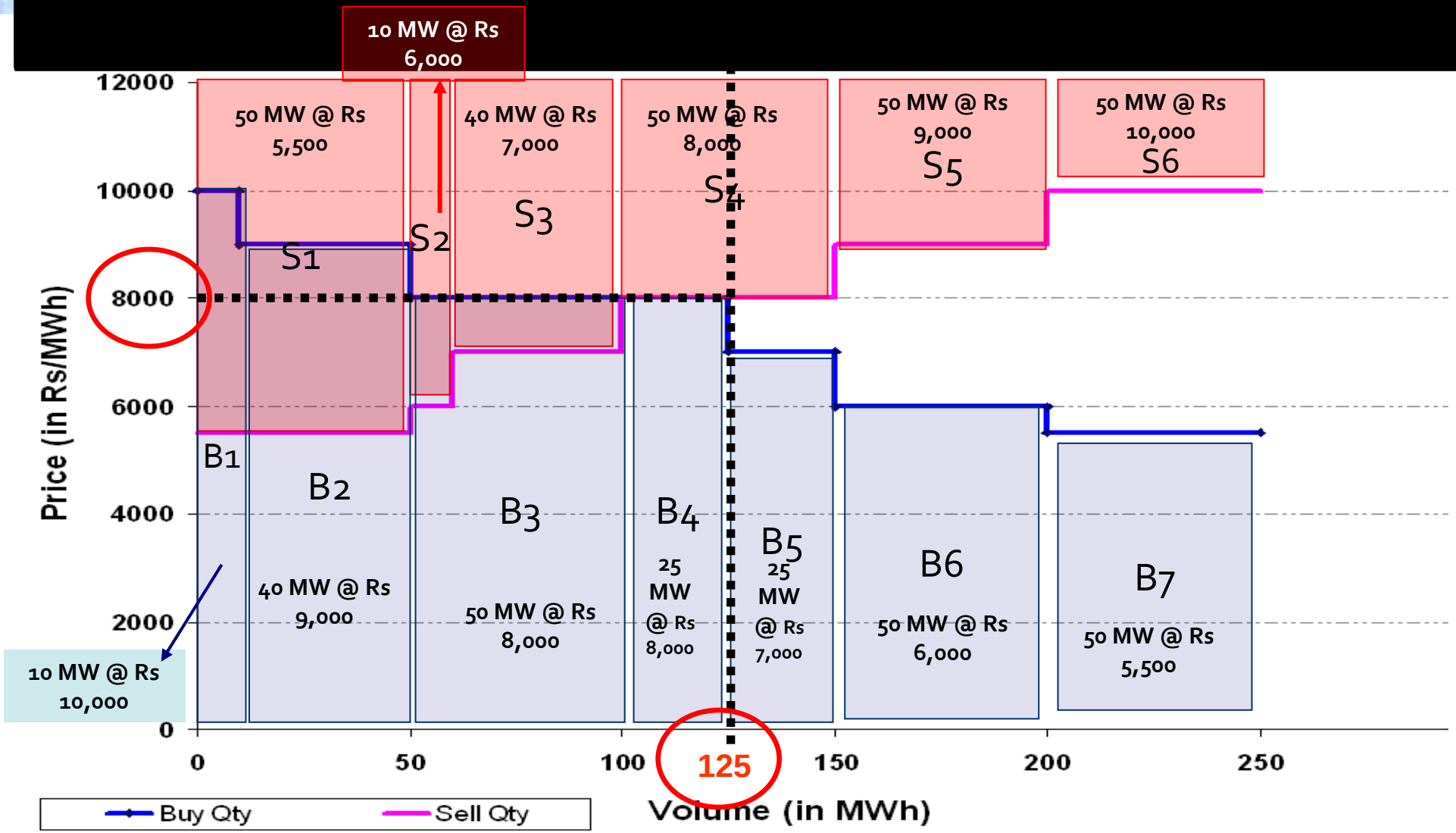
Seasonal Variations – Managed through Short Term trades, by

1) Traders, 2) Bilateral Contracts or 3) Banking Arrangements

Daily Variations – Managed through

1) Day ahead Power Exchange or 2) DSM

MCP :Rs 8000/MWh Volume: 125 MW



Price Discovery Methodologies in Various Products

Price Discovery Methodologies in Various Products

- The table given below summarizes the physical delivery-based contracts and their price discovery methodologies

Sr. No.	Name of the Contract	Price Discovery Methodology approved through present Order superseding the approval given in 160/MP/2021
1.	Integrated Day Ahead Market	Double Sided Close Bid Auction
2.	Real Time Market	Double Sided Close Bid Auction
3.	Day Ahead Contingency	Continuous Trade Session
4.	Intra-day	Continuous Trade Session
5.	Daily Contract	Uniform Price Step Auction
6.	Weekly Contract	Uniform Price Step Auction
7.	RECs	Double Sided Close Bid Auction
8.	ESCerts	Double Sided Close Bid Auction

Indian Power Market Structure

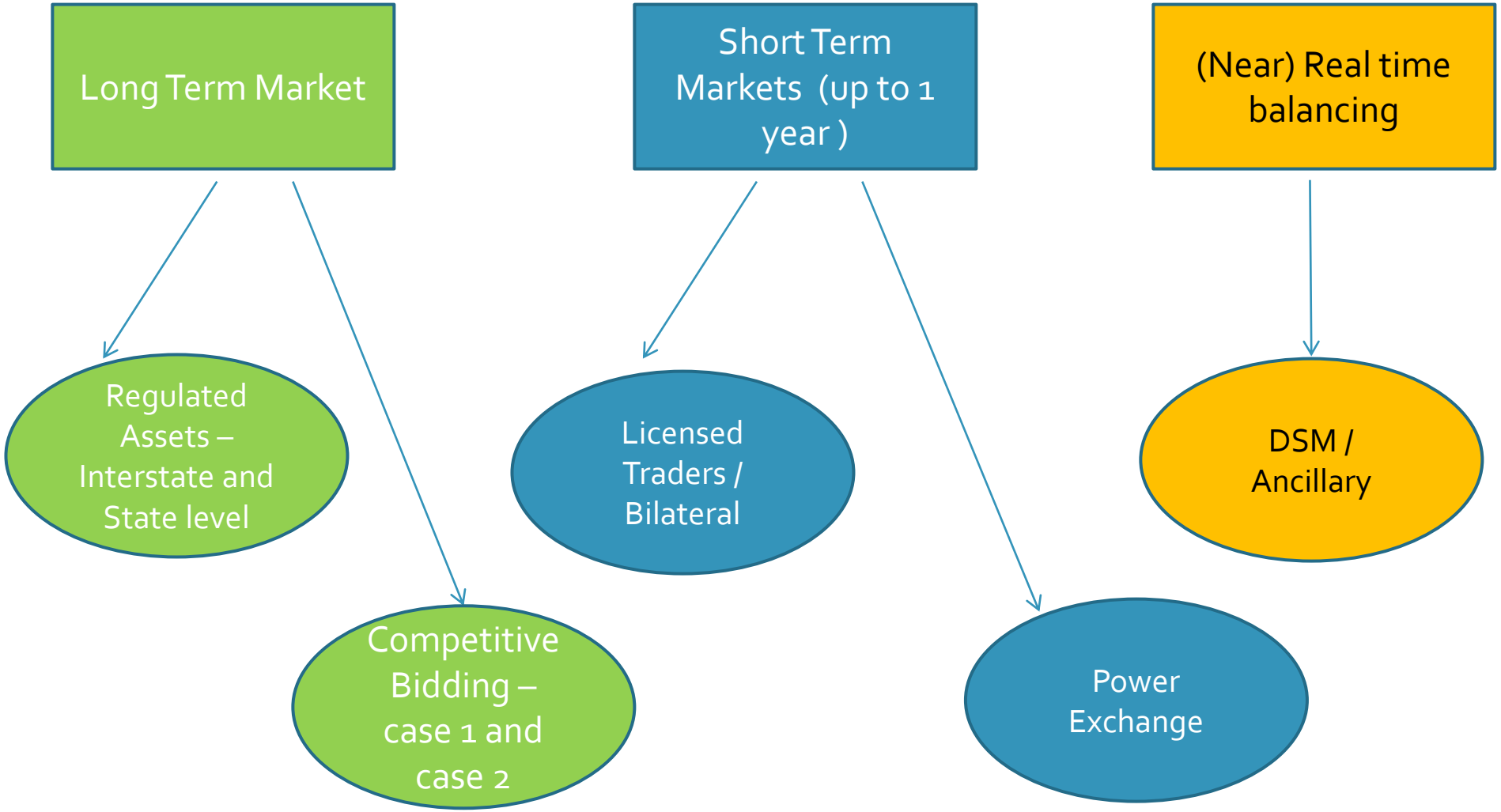
Indian Power Market Structure

Development of Indian Electricity Market

- **Till 1980's-Government promoted**
  - Capital Investment
- **1990's -Government guaranteed PPA**
  - Single buyer
- **2003 onwards - Market based**
  - Multiple buyers and sellers
  - Market is the risk mitigation
  - Exit from contract in case of default

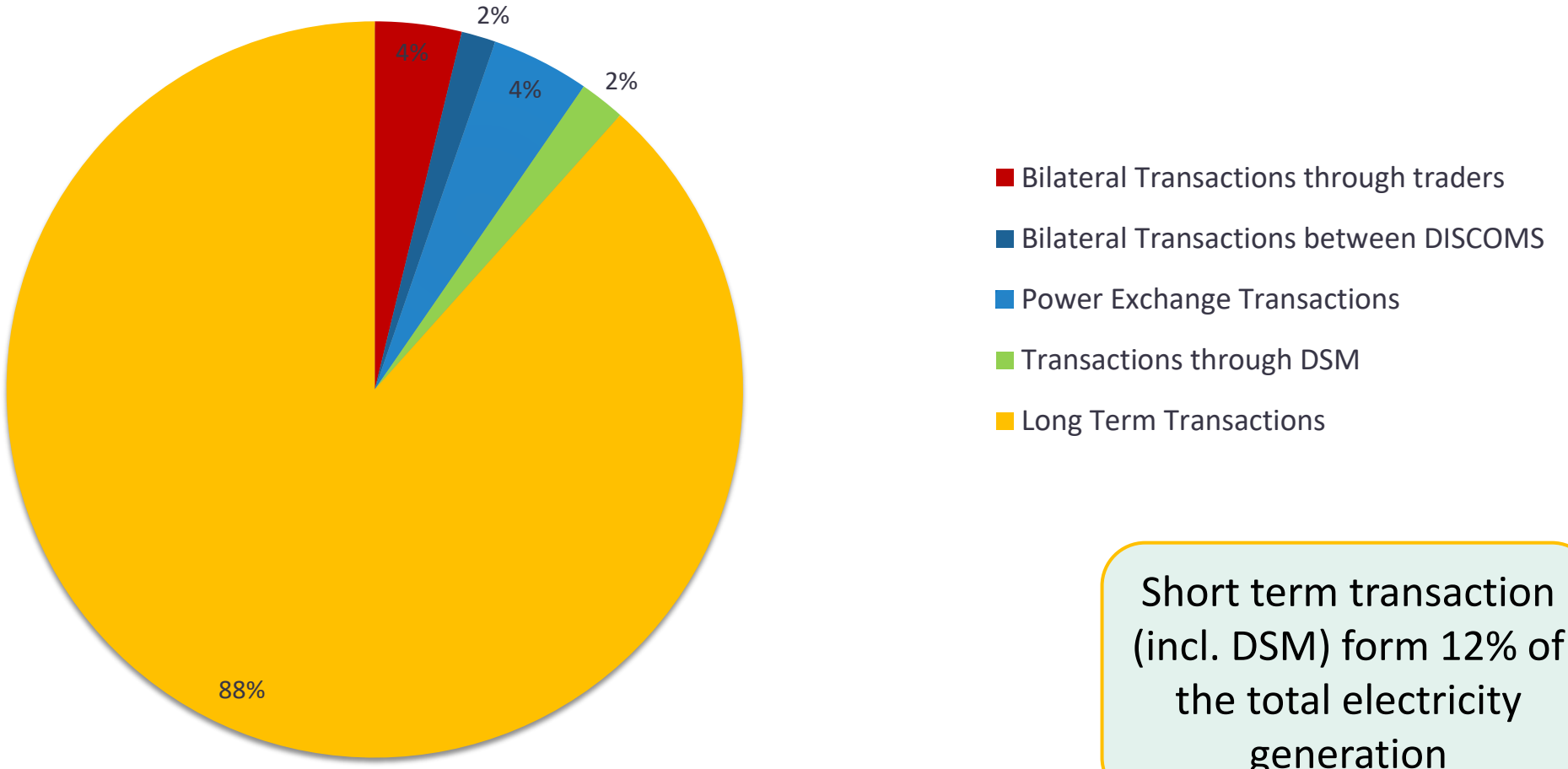
Indian Power Market Structure

Indian Power Market Structure



Indian Power Market Structure

Share of Market Segments in Total Electricity Generation, 2021-22



Short term transaction (incl. DSM) form 12% of the total electricity generation

Indian Power Market Structure

Different Market Types in India

- **Energy Market**
  - Does not have pure energy or capacity markets
  - Power exchanges – Energy market

- **Capacity Market**
  - Case 1 & Case 2 bids mimic Capacity + Energy Markets

- **(Near) Real Time market**
  - DSM Mechanism
  - Ancillary Market

- **Transmission Market**
  - Open Access

Thank You

Power Markets & load Forecasting

27th September 2022

Automated Solution for Energy Load Forecasting & Enterprise Visualization for NE States

Delivering impact – GETCO gains by implementing EPM

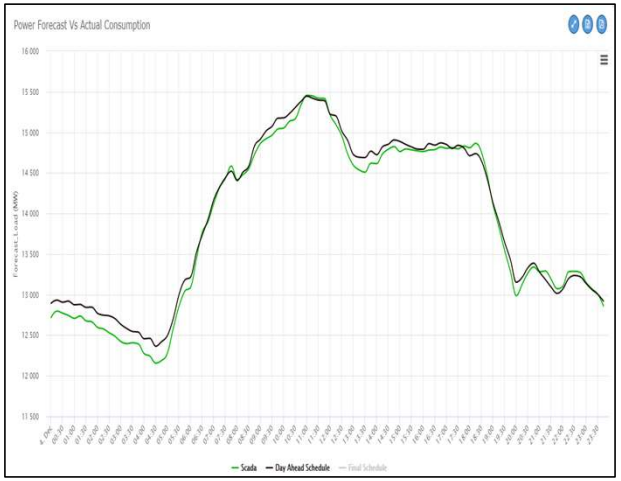
DSM comparison pre & post subscribing to our EPM Software – Implementation July 2019

MAPE – Moving Average Percentage Error

Month	Net DSM Charge (INR Cr.) (2018 – 19) *PRE*	Net DSM Charge (INR Cr.) (2019 – 20) *POST*	MAPE Day Ahead (%)	MAPE Intra Day (%)
July	10.41	17.29	5.64	1.77
August	-2.97	14.05	5.95	1.71
September	20.38	1.78	4.08	1.42
October	39.85	2.52	3.67	1.41
November	18.51	1.62	2.86	1.11
December	-1.45	0.07	2.04	1.03
January	3.36	3.47	2.49	1.07

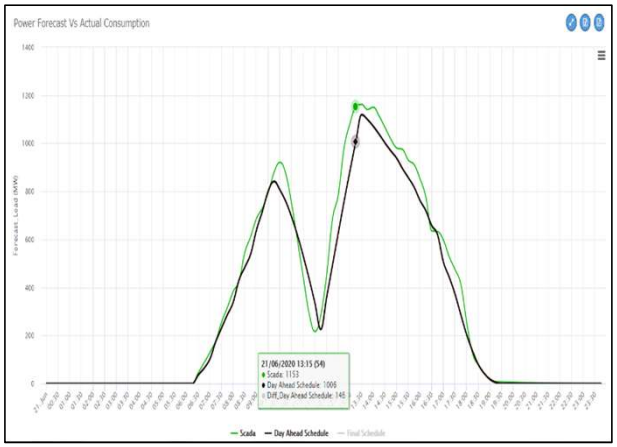
Ministry of Power Awarding Load Forecasting PoC to 50 Hertz

EPM platforms learns to forecast accurately – Use cases ....



4th Dec 2019

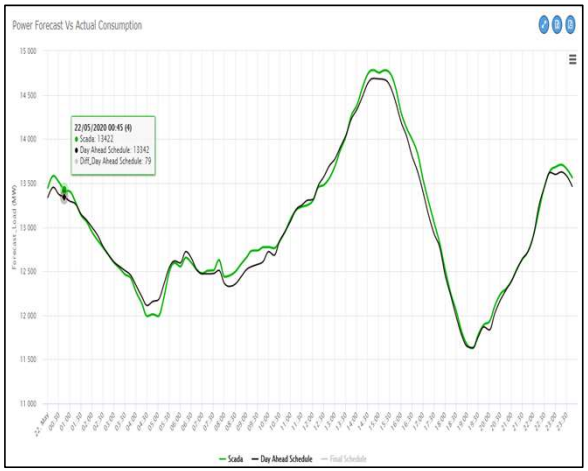
- AI ML deep learning during Navratri festival and other special events trained the system
- **Basing above, achieved 100% Accuracy for the Day Ahead Load Services**
- Machine Learning with excellent Load Data (Agricultural & Non Agricultural)& Weather Data Integration
- Effective Capture of Trend (within tolerance) despite Multiple Load Variation Challenges



21st June 2020

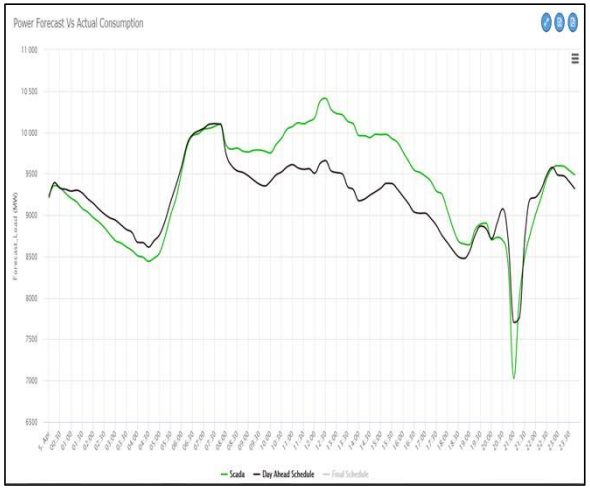
- Achieved 44/52 TBs in desired accuracy
- No Historical Precedence
- Machine Learning fully enabled to capture Solar Eclipse

….EPM platforms learns to forecast accurately – Use cases



22nd May 2020

- Achieved 100% Accuracy for the Day Ahead Load Services
- ***COVID Impacted Load Pattern captured for all TBs***
- Precise Machine Learning so as to overcome Multiple Load Variation Scenarios



5Th April 2020

- Achieved 15/19 TBs in desired accuracy during critical TBs commencing from 1915hrs till 2345hrs
- Missed Accuracy for 4 TBs in the critical Timeline within a range of 309 to 416 MW
- No Historical Precedence for enablement of Machine Learning
- Continuous Guidance & Mentoring by SLDC Team

Key Features – Energy portfolio management

EPM provides power management with increased real time supply demand balancing, monitoring and ability to control and react to change for power utilities. It supports energy market participants and market operators to minimize their demand and supply gaps and provide complete portfolio management solutions which includes various mechanism to further augment their daily operational requirements.

Demand and supply management

- Creation and analysis of Short, Mid and Long-term load/ demand forecasts (block-wise level)
- Demand side analysis –Supply surplus /deficit gap analysis
- Renewable energy scheduling & forecasting
- Contracts management

Supply forecast/ optimizer

- Build in logic for power replacement strategies across conventional and non-conventional sources of power
- Portfolio Optimization through the development of optimal sale/purchase strategy for replacement of power from the power markets

Network/ Entity Management

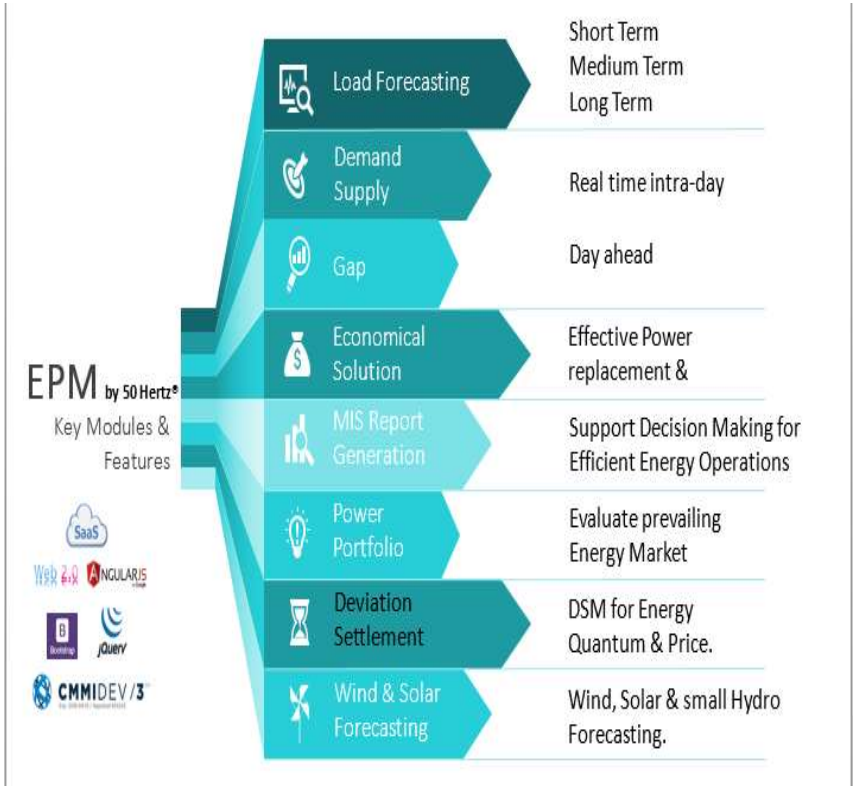
- Network monitoring, wide area monitoring, corridor availability, entity management, and negotiation, real-time schedule dialer

MIS Reporting

- Enterprise visualization, energy accounting, bill verification, deviation settlement mechanism, un-requisitioned surplus

Price forecasting

- Short, Medium and Long-term power procurement cost optimization strategy.



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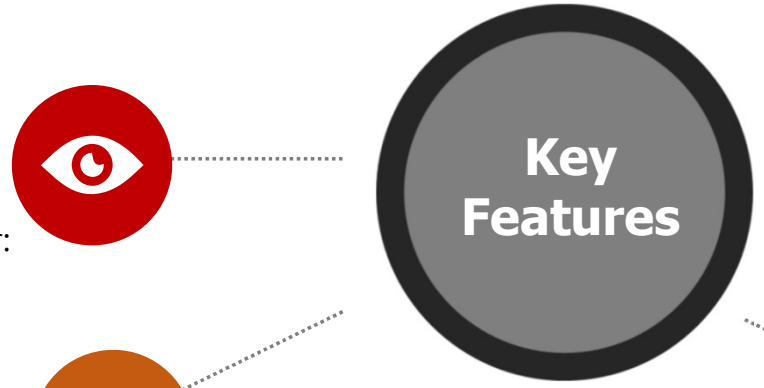
Key Features – Energy portfolio management



Solution for **Load forecasting**:
- Day Ahead
- Real time intra day
- Week Ahead
- Month Ahead
- Year Ahead

Availability estimate for:
- Real time intra day
- Day ahead

Gap Analysis & Scheduling
(Intra Day & Day Ahead)

- **Economical Solution** based on MOD to manage the Surplus/Deficit Power
- **Deviation Settlement Mechanism (DSM)** for energy quantum and price

SaaS (Software as a Service) Based Product/Solution

MIS report generation for Smooth Decision Making

Market insights for:
- **Surplus and Deficit of power**
- **Replacement of Power**

Power Portfolio Optimization and Evaluate energy market opportunities

Load / Demand Forecasting | Data Requirement

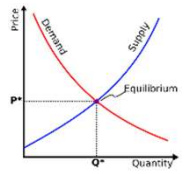
Weather Inputs

Temperature

Humidity

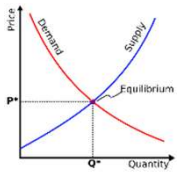
Rainfall

Radiation



Historical Demand Data (2 Years)

History



Live Demand Data (SCADA/SEM)

Live Data

Load type

Agricultural

Industry

Domestic

Commercial

Matches, Elections, Festivals and Marriages

SAT/SUN

Public Holidays and Weekends

Events

Regulatory Policies

Regulatory Impact

Population Growth

GDP

GDP

Econometric inputs

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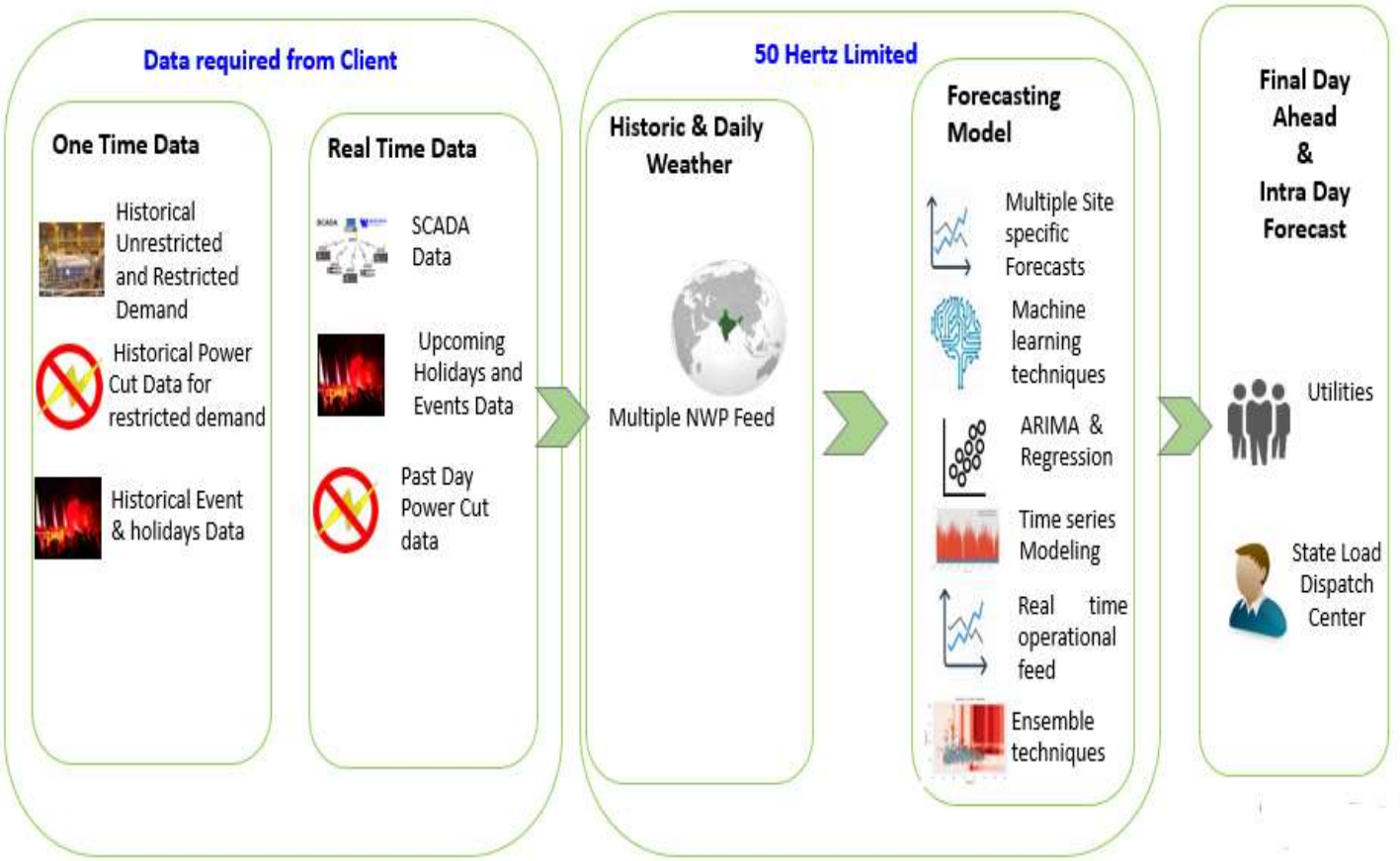
Technology

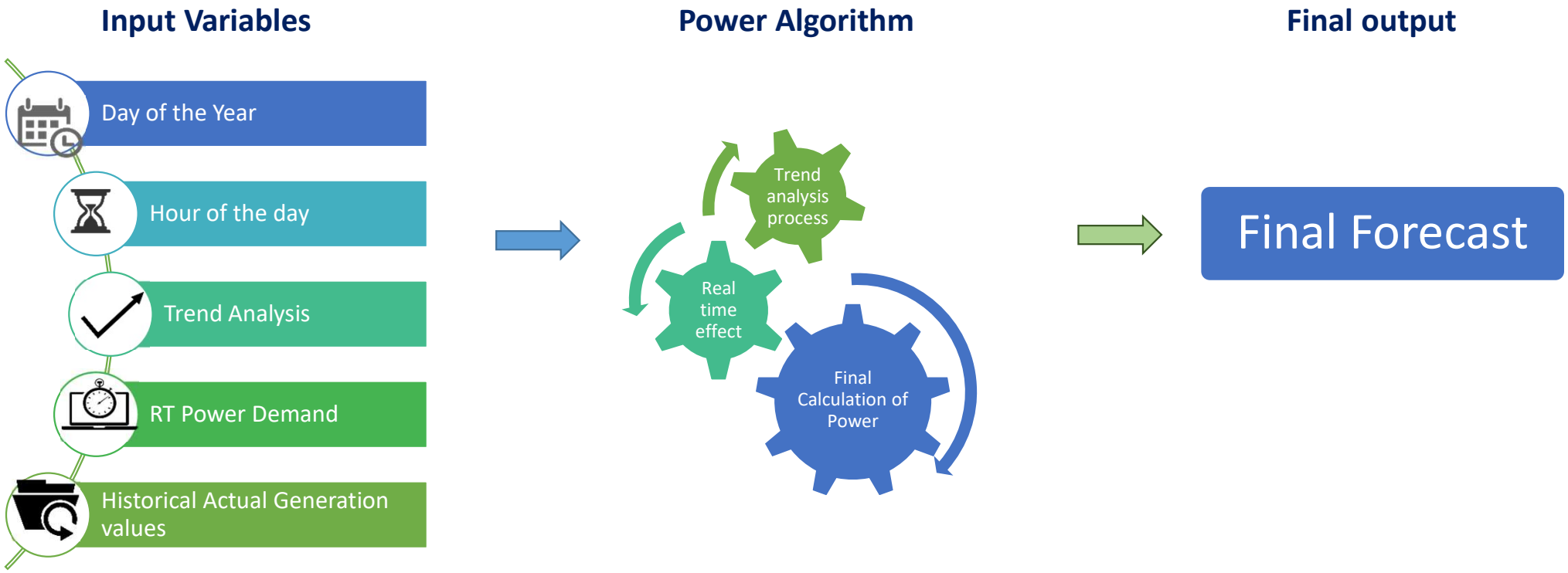
- ✓ **Computational intelligence** is a relatively **new research field**. The expression **computational intelligence** is commonly used to **refer** to the **fields of Fuzzy Systems, Artificial Neural Networks (ANN), evolutionary computation, and Swarm Intelligence**.

- ✓ Holistic AI & ML based Load Forecasting Algorithms have been developed in house incorporating both Quantitative & Qualitative Forecasting Methodologies.

- ✓ Regression Analysis, Decomposition Methods, Exponential Smoothing, Box-Jenkins Methodology, Subjective Curve Fitting, Delphi Method, Technological Comparisons, Time Series Modelling, ARIMA (Auto Regressive Integrated Moving Average.



AI / ML based Load / Demand Forecasting | Concept



The statistical architecture uses various inputs which are fed into the In-house machine learning algorithm for determining trend analysis and to incorporate the latest real time power generation. Comparison of both with Actual Power generation, the weights are automatically decided to provide us with final forecast

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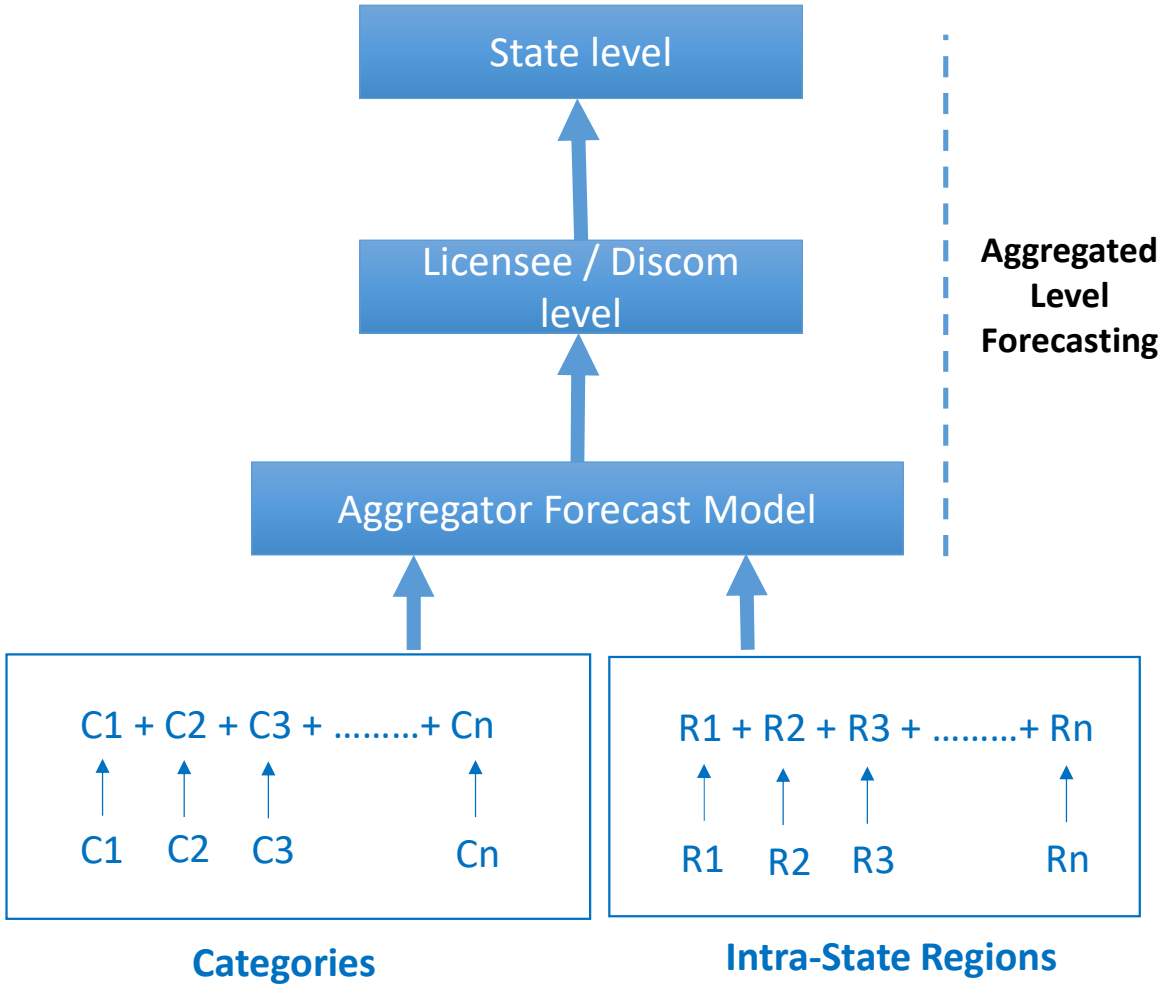
Hierarchical / Aggregated Forecasting

Forecasting at Intra-State Region and category load aggregated to Distribution Licensee level or at State Level.

Every Region & Load Category is unique:

- Forecast generated on each Region and Load Category based on location, Weather impact, seasons etc.
- Aggregating to multiple region and Category load.
- Accuracy being proportional to granularity of Data.

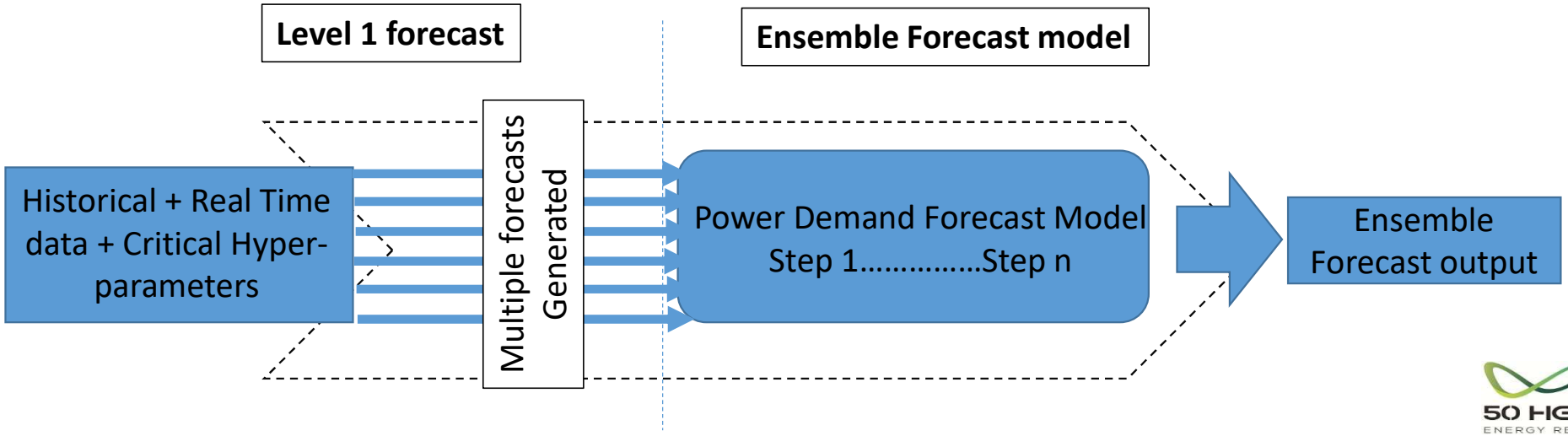
Current Approach



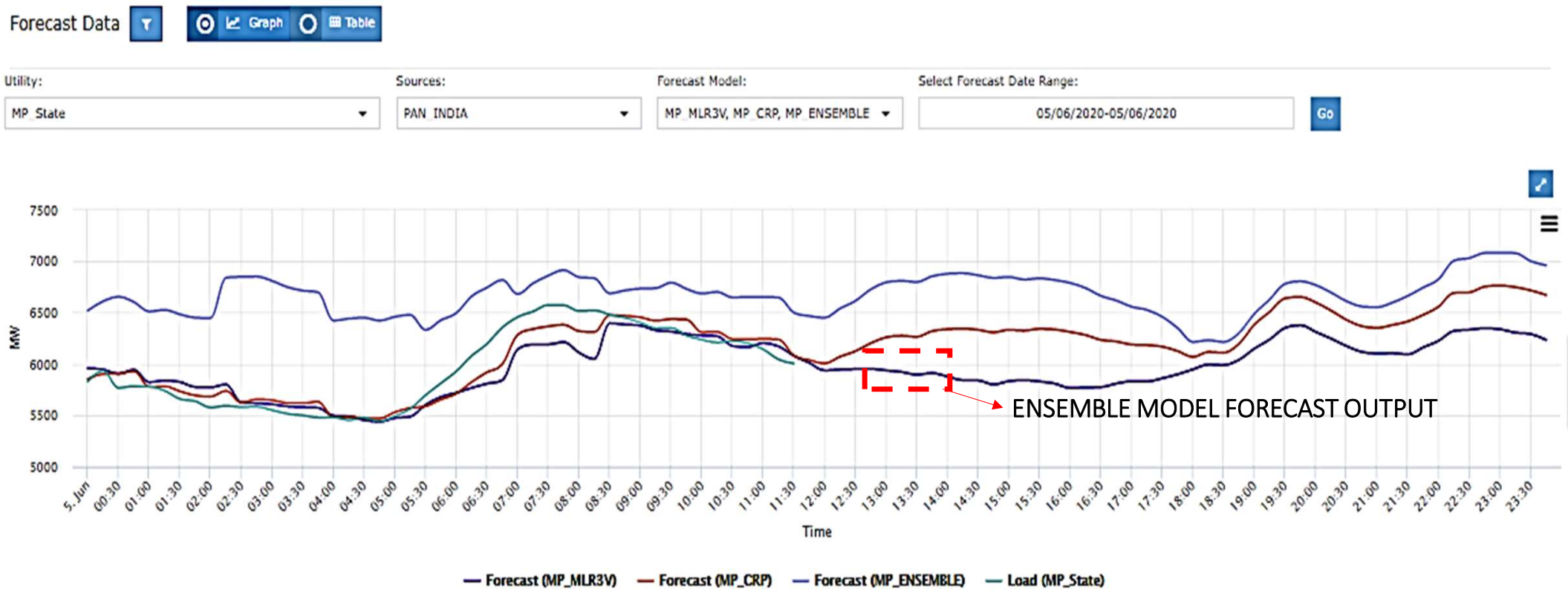
Ensemble forecast output

The **Algorithms** utilised for Load Forecasting Services has state of the art machine learning technique incorporated to **combine the effect** of a **minimum of two or more best accurate models** so as to **ensure best** forecast **accuracy.**

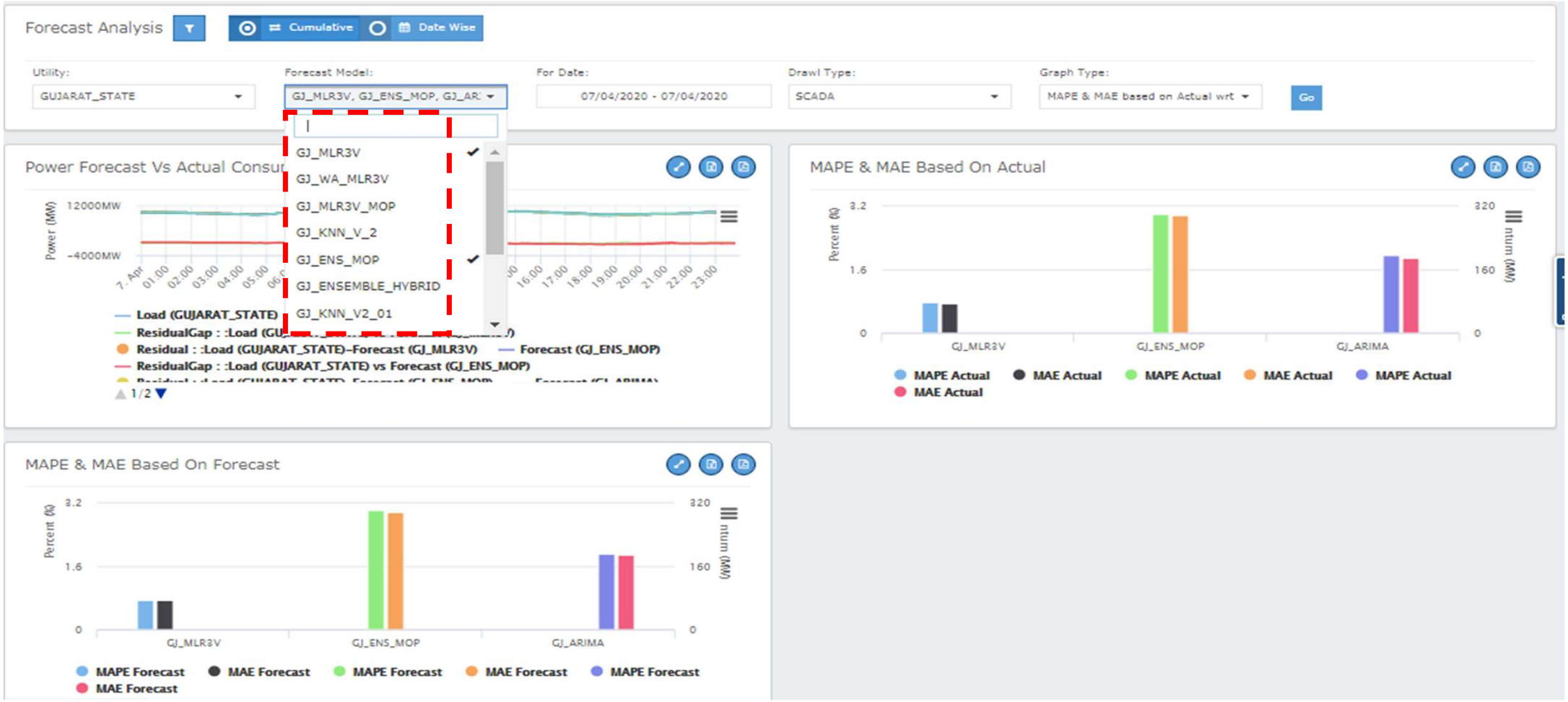
It is to **highlight** & **take note** that **each** of the **Ensemble Members** are **duly analysed** in respect of its **overall performance** and **formulated** in **crisp algorithms** for **achieving optimal Forecasting Accuracy** in **fastest processing time**.



Ensemble forecast output



Multiple Model Forecasting Capability with Best Accurate Models



Merit Order Automation – Process Flow

Generator's Data

Fixed & Variable cost of ISGS/CGS and SGS plants

Minimum Technical Limit, Ramp Rate, Install Capacity & Outage reports of ISGS & SGS plants.

Analytics System

Forecast Prices of Exchange

Declare Capability of Generators

Entitlement of Utility from Generators

URS power of ISGS plants

UI Rate

System Output

Decision Support for

Surrender of power from ISGS

Back down of power from SGS

DSM

Sell on Exchange

Bilateral trade

Demand-Supply GAP Analysis & Merit Order Dispatch (MOD) | Workflow

The Forecasted Unrestricted Demand (system Generated Latest Forecast) is considered as the Upcoming Demand/ Load

Calculating Availability – Fetching Data from all the provided sources

Finding out the GAP - The difference between Forecast Unrestricted Demand and Total Availability is the GAP

Buffer – Customized to State or Discoms

GAP After Buffer – If any Discoms opts for Buffer option then the quantum in Buffer will be deducted from the GAP and thus get the Tradable Quantum

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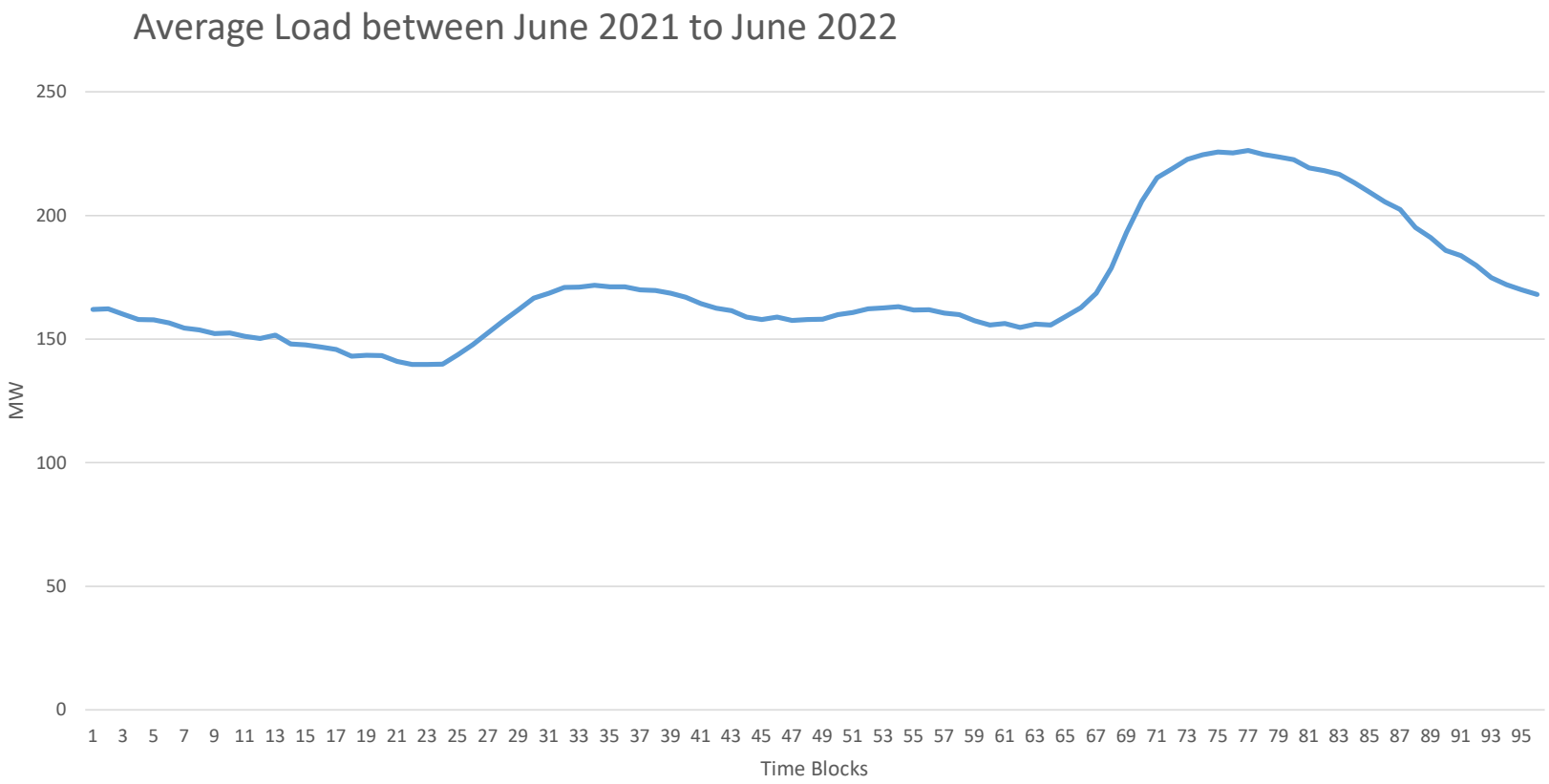
MIS, Visualization, Customized Reporting & Mobility

- ✓ Capability to consume the data from multiple source & subsequent calculations.
- ✓ Capability to generate MIS reports on the basis of the customized requirements.
- ✓ Capability to captures and display the outage data in multiple file formats (.csv, .xls, .xlsx etc.)
- ✓ User friendly dashboard.
- ✓ System is highly scalable & configurable as per the client requirement.
- ✓ Authentication and role based access
- ✓ Drag and Drop feature available
- ✓ Mobile application enabling users based access on the go.

Case study - Tripura

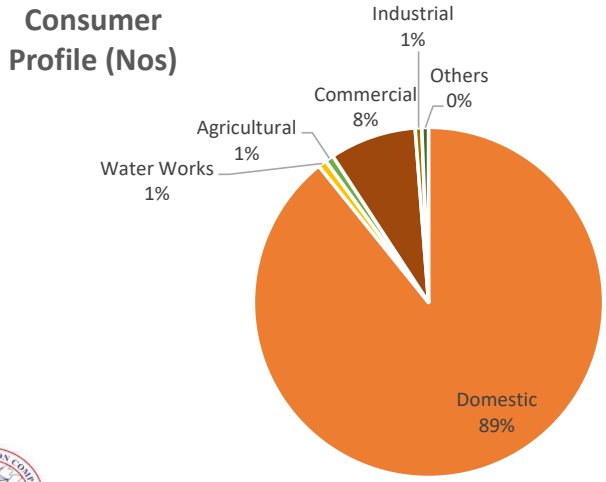


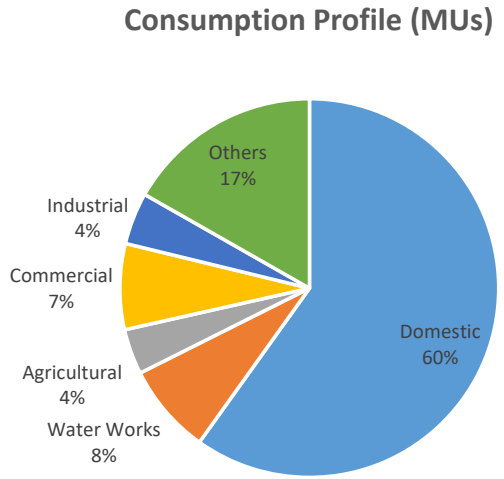
Source of Data: Vidyut Prabha (https://www.vidyutpravah.in/)

Consumer & Consumption Profile : Tripura

Consumer Profile (Nos.)		
Type	**Nos**	**%**
Domestic	832221	89.23
Water Works	7271	0.78
Agricultural	7268	0.78
Commercial	74568	7.99
Industrial	5816	0.62
Others	5571	0.60
Total	**932715**	**100**

Consumption Profile (MUs)	
Type	**%**
Domestic	59.88
Water Works	7.73
Agricultural	3.87
Commercial	7.33
Industrial	4.42
Others	16.77

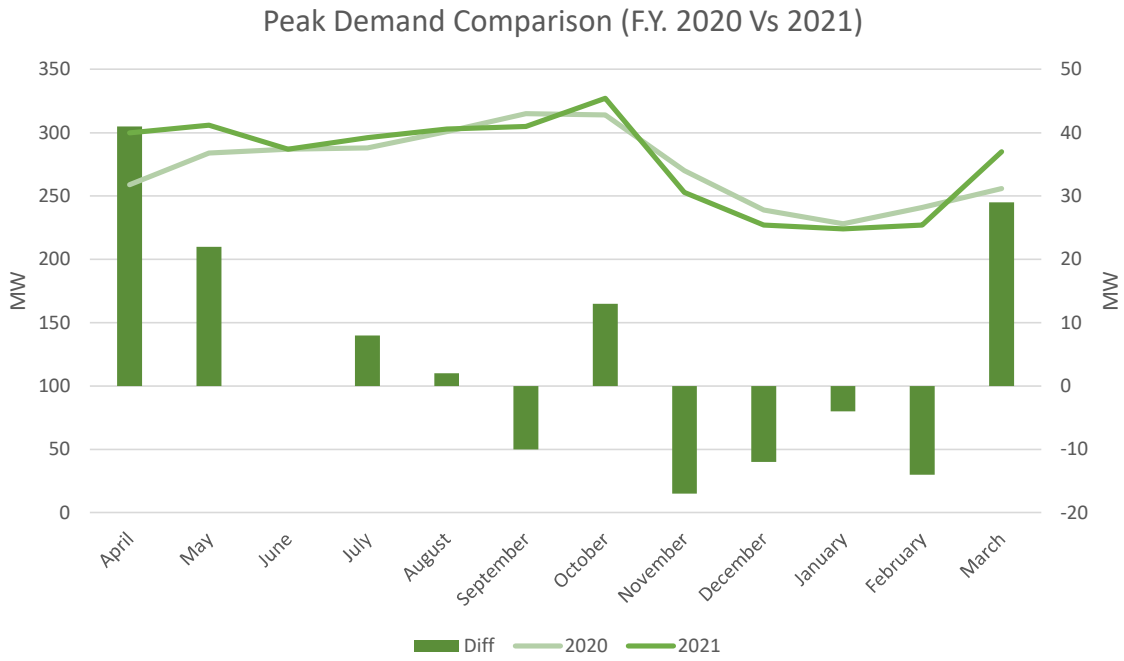




Source of data: https://www.tsecl.in/irj/go/km/docs/internet/TRIPURA/New_Website1/Company_Profile.html

YoY Peak Demand Comparison : Tripura

Peak Demand Comparison (MW)			
Month	**2020-21**	**2021-22**	**Diff**
April	259	300	41
May	284	306	22
June	287	287	0
July	288	296	8
August	301	303	2
September	315	305	-10
October	314	327	13
November	270	253	-17
December	239	227	-12
January	228	224	-4
February	241	227	-14
March	256	285	29

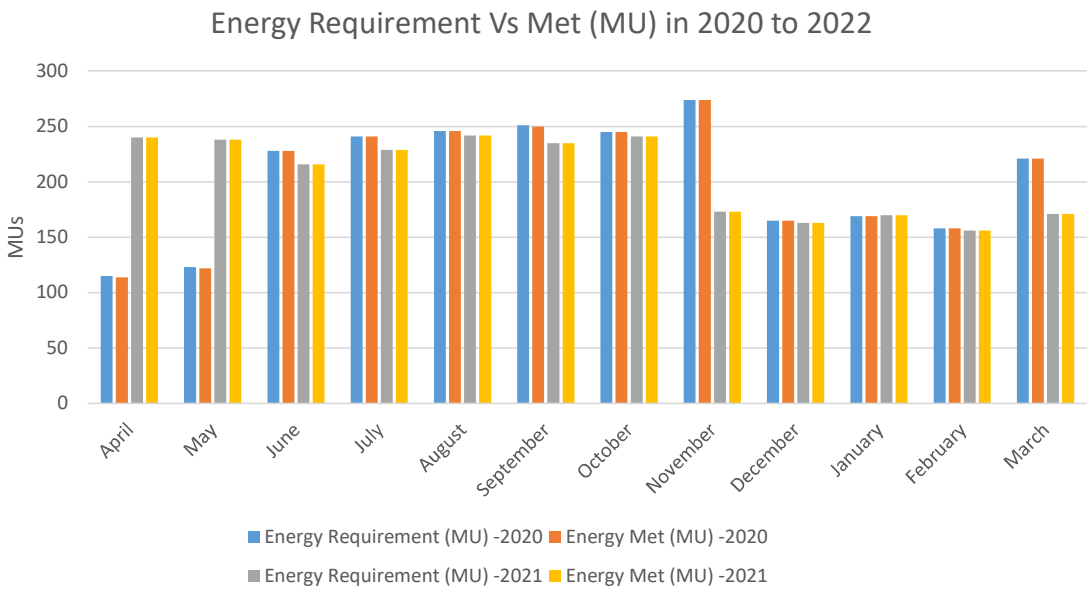


It is observed that there is increase in Peak Demand from 2020-21 to 2021-22 in the months of April to August, October & March and decrease in Peak Demand from November to February

Source of data: https://posoco.in/reports/monthly-reports/

Energy Requirement | Energy Met : Tripura

Month	Energy Requirement (MU) 2020-21	Energy Met (MU) 2020-21	Energy Requirement (MU) 2021-22	Energy Met (MU) 2021-22
April	115	**114**	240	240
May	123	**122**	238	238
June	228	228	216	216
July	241	241	229	229
August	246	246	242	242
September	251	**250**	235	235
October	245	245	241	241
November	274	274	173	173
December	165	165	163	163
January	169	169	170	170
February	158	158	156	156
March	221	221	171	171

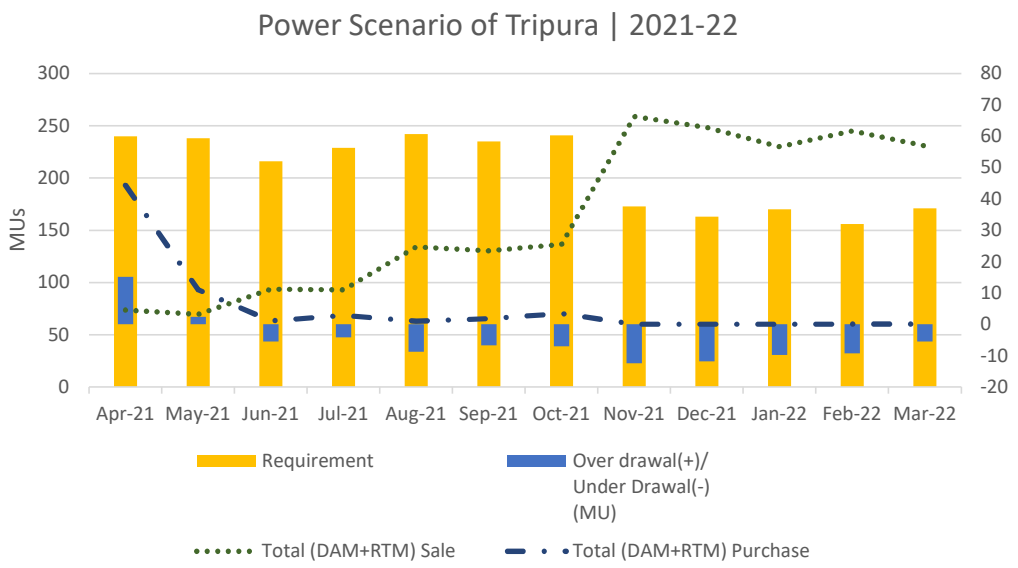


1. It is observed that Tripura State Electricity Corporation Limited (TSECL) has managed to Met the Energy Requirement through out the year of 2021-22
2. In April & May it is seen increase in Demand than the Previous Year, where as the Peak Demand rise was only 41 MW in April, so the rise was gradual.
3. In November & March it is seen decrease in Demand than the Previous Year

Source of data: https://posoco.in/reports/monthly-reports/

Power Scenario | 2021-22: Tripura

Month	Requirement	Over drawal(+)/ Under Drawal(-)	Total (DAM+RTM)	
			Sale	Purchase
Apr-21	240	15.17	4.52	44.31
May-21	238	2.4	3.16	10.95
Jun-21	216	-5.5	11.2	1.11
Jul-21	229	-4.15	10.94	2.77
Aug-21	242	-8.74	24.67	0.95
Sep-21	235	-6.72	23.46	1.83
Oct-21	241	-6.98	25.51	3.44
Nov-21	173	-12.43	66.26	0
Dec-21	163	-11.76	62.74	0
Jan-22	170	-9.78	56.61	0
Feb-22	156	-9.2	61.62	0.04
Mar-22	171	-5.5	56.96	0.05



It is observed that:

1. To Meet the Requirement TSECL has Overdrawn power and also Purchased Power from DAM and RTM during April & May
2. But from June onwards there was Surplus of Power which was Further Sold in DAM & RTM and Rest power went underdrawn

Source of data: https://posoco.in/reports/monthly-reports/

DSM | Nov 2021 to June 22 : Tripura

From Date	To Date	Schedule (MWH)	Actual (MWH)	Deviation (MWH)	Deviation Charge		ADDITIONAL DEVIATION CHARGE DUE TO BLOCKWISE VIOLATION OF	ZERO CROSSING VIOLATION COUNT	ADDITIONAL DEVIATION CHARGE DUE TO VIOLATION OF SIGN CHANGE	FINAL DEVIATION CHARGE	
					Receivable	Payable				Receivable	Payable
01-11-2021	**19-06-2022**	6,74,216	6,14,540	-59,676	25,05,04,378	2,57,29,791	2,03,16,203	94	53,16,049	23,46,35,138	3,54,92,808
Net Amount					**22,47,74,587**		**2,03,16,203**		**53,16,049**	**19,91,42,330**	

It is observed that TSECL has mostly Underdrawn power during Nov 21 to June 22, and Received around Rs.20 Crores approx. in return.

Is the Power Purchase cost of the Underdrawn power is less/ more than Rs.20 Crores ???

Source of data: http://www.nerpc.nic.in/DSM_Statement.php

Indicative DSM Vs DAM/RTM | Tripura

A Block wise Calculation from 4th April to 5th June 2022 (63 Days) has been prepared where Over Drawn / Under Drawn power could have been Purchased / Sold in the Exchange:

Description	Qtm/ Amount	Recivable/ Payable
Average Energy Under Drawn during this period (MWH)	8887	
Total Normal Deviation Amount	₹ 3,73,94,054	Receivable
Total Additional Deviation Amount	₹ 1,49,00,890	Payable
Total Sustained Deviation / Block Violation Amount	₹ 3,19,240	Payable
Total Deviation Amount	**₹ 2,21,73,924**	**Receivable**
If Same Quantum (Block Wise) Purchased/ Sold in DAM	₹ 7,75,79,888	Receivable
Profit Could have been realized from DAM Trade	₹ 5,54,05,964	Receivable
Daily Average Profit Realization Missed from DAM Trade	**₹ 8,79,460**	**Receivable**
If Same Quantum (Block Wise) Purchased/ Sold in RTM	₹ 6,02,87,291	Receivable
Profit Could have been realized from RTM Trade	₹ 3,81,13,367	Receivable
Daily Average Profit Realization Missed from RTM Trade	**₹ 6,04,974**	**Receivable**

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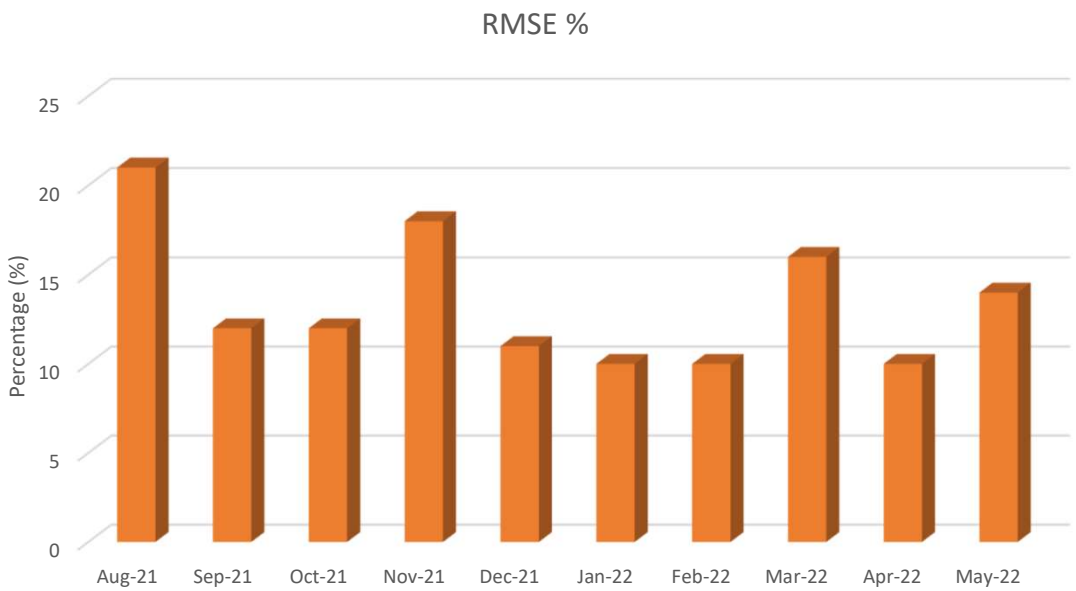
RMSE % | Aug 2021 to May 22 : Tripura

OCC MoM	Month	RMSE %
182	**Aug-21**	21
183	**Sep-21**	12
184	**Oct-21**	12
185	**Nov-21**	18
186	**Dec-21**	11
187	**Jan-22**	10
188	**Feb-22**	10
189	**Mar-22**	16
190	**Apr-22**	10
191	**May-22**	14
Average of 10 Months		**13.4**



It is observed that Load Forecast Error/ RSME % of TSECL has never been below 10%.

Source of data: http://www.nerpc.nic.in/Minutes_OCC.php

Summary - Tripura

Observations

- Tripura is a state where 60% of the Load is Domestic Load
- TSECL has managed the power requirement and fulfilled the Load requirement on the last 2 years
- Tripura is a Surplus State:
  - Hence have to Sale power in DAM+RTM
  - Even Tripura has to Underdraw huge quantum of power
- Is the DSM Amount received more than the Cost of Purchase of same Power.
- RMSE % of Tripura is quite high

Solutions

- ✓ A Better Forecasting Tool so as to understand the Load Requirement on Day Ahead, Intra day, Quarter Ahead and Year Ahead basis
- ✓ Forecast will help in better Scheduling, so as to avoid huge Overdraw/ Under draw from the Grid
- ✓ Improves Grid stability
- ✓ Reducing the Power Purchase Cost
- ✓ Reduce RMSE % (Load Forecasting Error)

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About 50 Hertz

Vision

To become a **Global Leader in ENERGY** Domain by delivering World Class Intelligent Solution

Our Services

Consulting

Software Development

IT Services

Enterprise Software

Mission

Provide **Next Gen Innovative Solutions By Empowering Power Utilities** with Economical, Efficient and Effective Solutions for a **SUSTAINABLE FUTURE**

Certifications

CMMI DEV/3

ISO 9001

ISO 27001

ISO 20000

ISO 14001:2015

Offices

New Delhi Headquarters

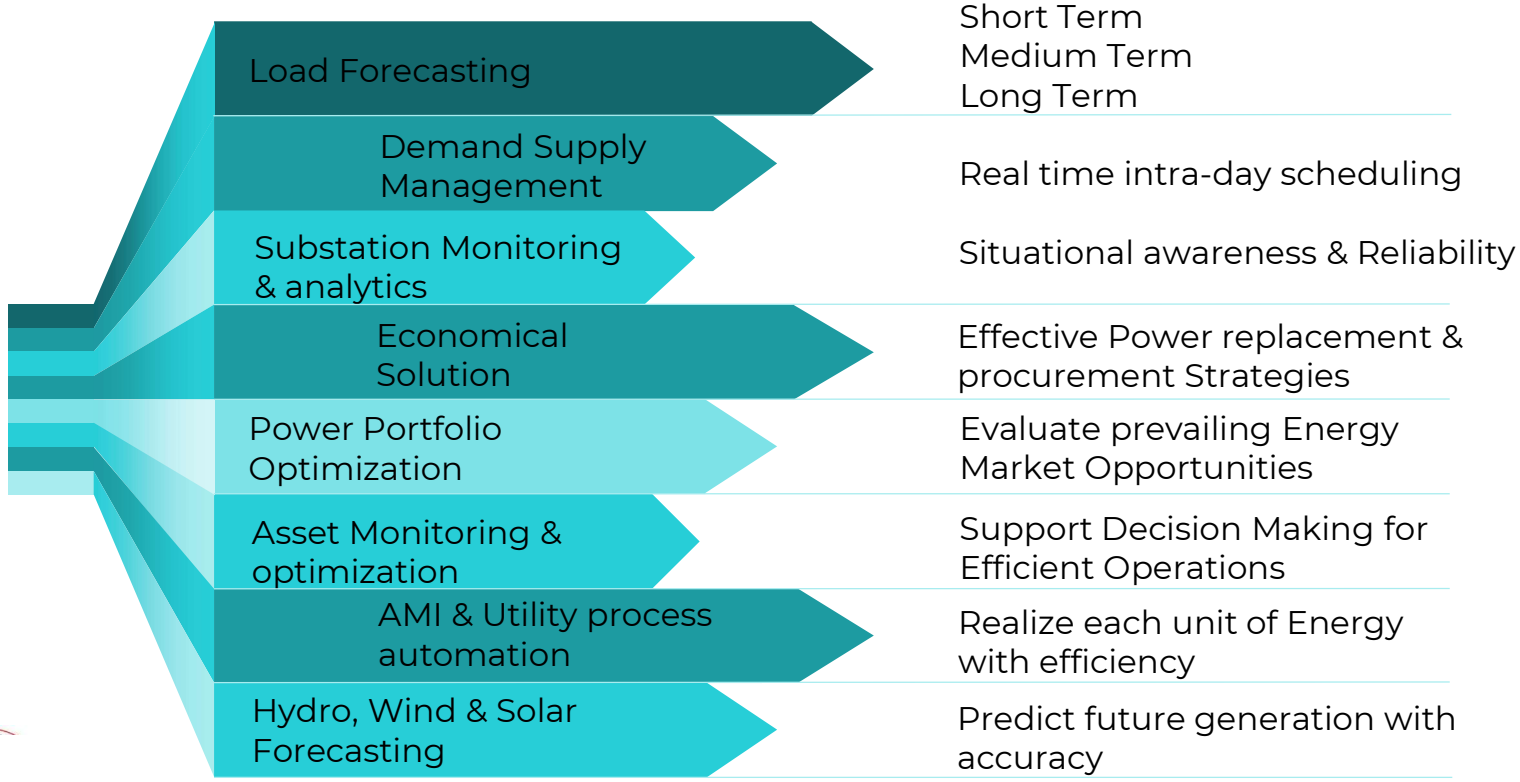
7 Branch Offices in India

2 International Research Centres

13 International Sales Offices

Delivering IMPACT

Solution powered by 50 Hertz Limited empowers **Power utilities, IPP's & Partners ecosystem** to make informed business decisions by providing measurable, strategic and tactical solutions.



Enhance **Power Utility** Revenue and efficiency by **~ 15 to 20+ %**

To an **IPP ,** delivers improvement in IRR by **~ 5 to 10+ %**

To **Partners in ecosystem ,** delivers attractive ROI of **Solid Double digit**

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Key Milestones | Utilities

GETCO:

Solution offered: Forecasting & Scheduling
Period – April 2019 till date
Portfolio: 20 GW (Load); 9.5 (Solar & Wind)
Accuracy Achieved ~ DA 97%

MPPTCL:

Solution offered: Energy Portfolio Management
Period – Sept 2017 till Date
Portfolio: ~11 GW (Load)
Accuracy Achieved ~ DA 98.57%

BSPHCL:

Solution offered: Energy Portfolio Management
Period – April 2016 to Jan 2021
Portfolio: ~5GW (Load)
Accuracy Achieved ~ DA 98 %

Gridco:

Solution offered: Energy Portfolio Management
Period – October 2017 to Sept 2019
Portfolio: ~5GW (Load)
Accuracy Achieved ~ DA 97 %

TANTRANSCO:

Solution offered: Energy Portfolio Management
Period – October 2017 to Sept 2019
Portfolio: ~5GW (Load)
Accuracy Achieved ~ DA 97 %

OPTCL :

Solution offered: Load Forecasting
Period – June 2021 till date
Portfolio: ~ 3 GW (Load)
Accuracy Achieved ~ DA 96 %

PITCUL :

Solution offered: Load Forecasting
Period – Project Initiated
Portfolio: ~ 1.6 GW (Load)

PSTCL :

Solution offered: Load & RE Forecasting + SAMAST
Period – Project Initiated
Portfolio: ~ 5 GW (Load)

Key product offerings

Asset Monitoring & Management Solutions (Solar, Wind & Hydro)

Renewable Energy (Wind & Solar) **Forecasting (RE)**

Substation Automation & Monitoring Systems

Energy Portfolio Management (EPM) **In Power Utilities**

AMI / AMR & Smart Metering Solution

Integrated Energy Management Solution (SAMAST)

Our Journey

2012

Genesis of Analytical Research Centre

2013-14

Launch of Smart Energy Meter Data Acquisition System (SEMS)

RE SCADA Integration & Analytics

2015

CMMI DEV/3

Research started on Energy Portfolio Management Solution (EPMS)

2016-17

Customized development

BSPHCL | NTPC | GRIDCO Empowering Odisha

International Research Centre

ISO 9001 | ISO 27001

2018

+15GW Portfolio

Asset Management Solution – Research Initiated

AboitizPower A Better Future

2019-20

EPMS
(Load/Renewable: 19GW/8GW)

GETCO

+83 GW Portfolio

IIM Lucknow

Inception of SAMAST

2021

Real-Time Data Acquisition System (RTDAS)

Substation Automation & Monitoring Solution

IOT based state of the Art solution in Power Sector.

2022

Battery Storage Management

Big Data Management & Analytics & DT level Forecasting & Technology Rich Solutions.

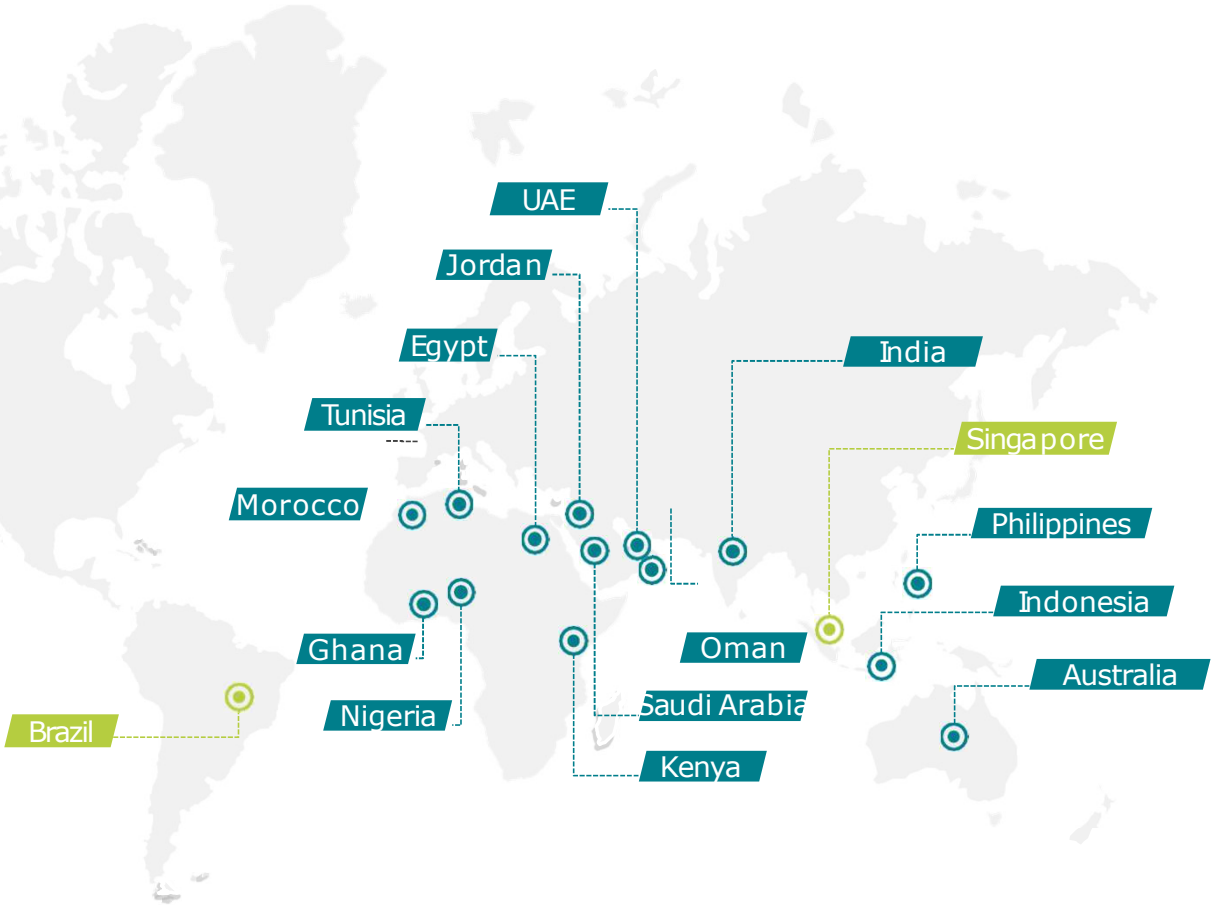
50 HERTZ ENERGY REDEFINED

Global Presence

- International Research Centers
- Sales Office

INDIA

- Corporate Headquarters: New Delhi
- Branch Offices:
  - Mumbai
  - Kolkata
  - Chennai
  - Hyderabad
  - Bengaluru
  - Vadodara



Key Takeaways

Minimise Power Purchase Cost and enable optimum utilization of resources

Enables the Long Term (Week Ahead, Month Ahead & Year Ahead) Forecast reducing the dependency on Exchange Purchases (STOA) being a volatile market

Holistic and Bird eye view of the entire DSM operation- **Transparency**

Proactive alert Mechanism & Pop-Ups to enable sign change and avoid Penalties – **Situational awareness**

Real time Monitoring and fact based decision support system- **Truly Dynamic**

System reduces DSM penalties drastically - **Demonstrated capability**

Accurate forecast to accurate scheduling **leading to reduced penalty** and **Data driven Power procurement**

System deployable within 7- 15 Days

50 HERTZ
ENERGY REDEFINED

Happy to answer your queries

Thank You

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Vineet.kumar@50hertz.in

50 HERTZ
ENERGY REDEFINED

“We will make the electricity so cheap that only the rich will burn candles”

- Thomas Alva Edison

HIGHLIGHTS OF TURNING AROUND POWER DISTRIBUTION SECTOR BY NITI AAYOG

46TH COMMERCIAL COORDINATION MEETING

NORTH EASTERN REGIONAL POWER COMMITTEE

MINISTRY OF POWER

GOVERNMENT OF INDIA

1 Introduction

CHALLENGES OF ELECTRICTY DISTRIBUTION IN INDIA

Inefficient cost optimization due to high dependence on legacy power purchase agreements and low use of power markets

Govt & Regulation

Sector governance and local **political-economic complications**

Operational & Managerial

Regulatory & Political

Technology

Inadequate fast ramping capacity in older generators

Transmission

Discoms

Thermal generation

Overdependence on explicit state government subsidies and tariff cross subsidy, and non-cost reflective tariff.

Particularly important for agriculture rich states where subsidy burden is higher

High line losses due to both geographical constraints and underinvestment

Distribution

Variable renewable energy

Distributed renewable energy

Customer

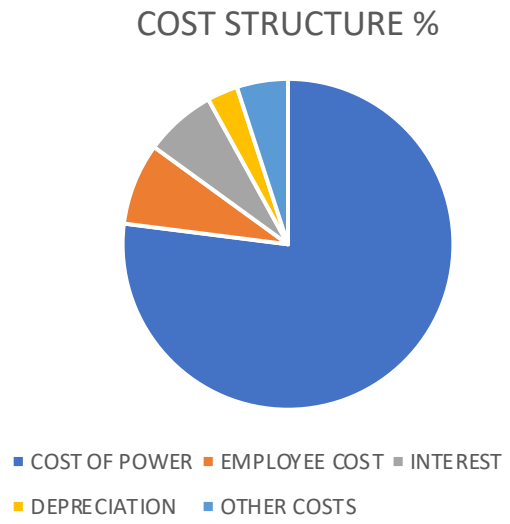
Billing, metering, and collection challenges are typically a combination of factors including technology (inadequate meter penetration), human factors (low availability), and geography (spiral and low density).

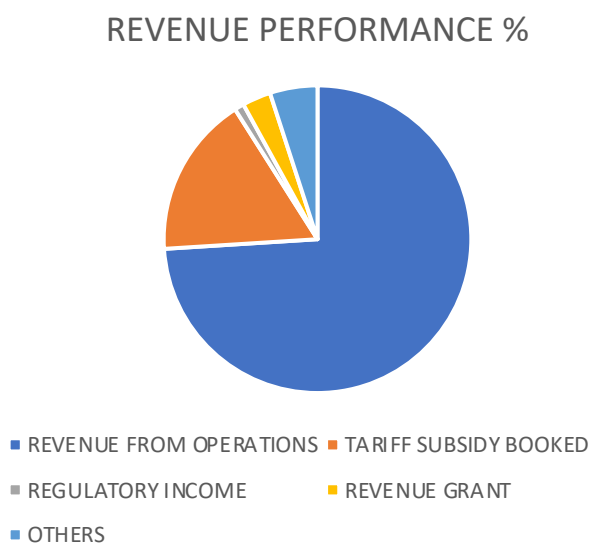
Curtailment of generation due to grid constraints, commercial conditions, and inadequate RE forecasting results in inefficient operation of low or no marginal cost generators

Theft is conducted using a variety of novel methods that include meter tampering or removal, tapping illegally into bare wires, slowing down electronic meters using magnets

Inadequate demand side management and a disproportionate growth in peak demand characterized by a higher peak -to-average ratio

COST STRUCTURE AND REVENUE PERFORMANCE



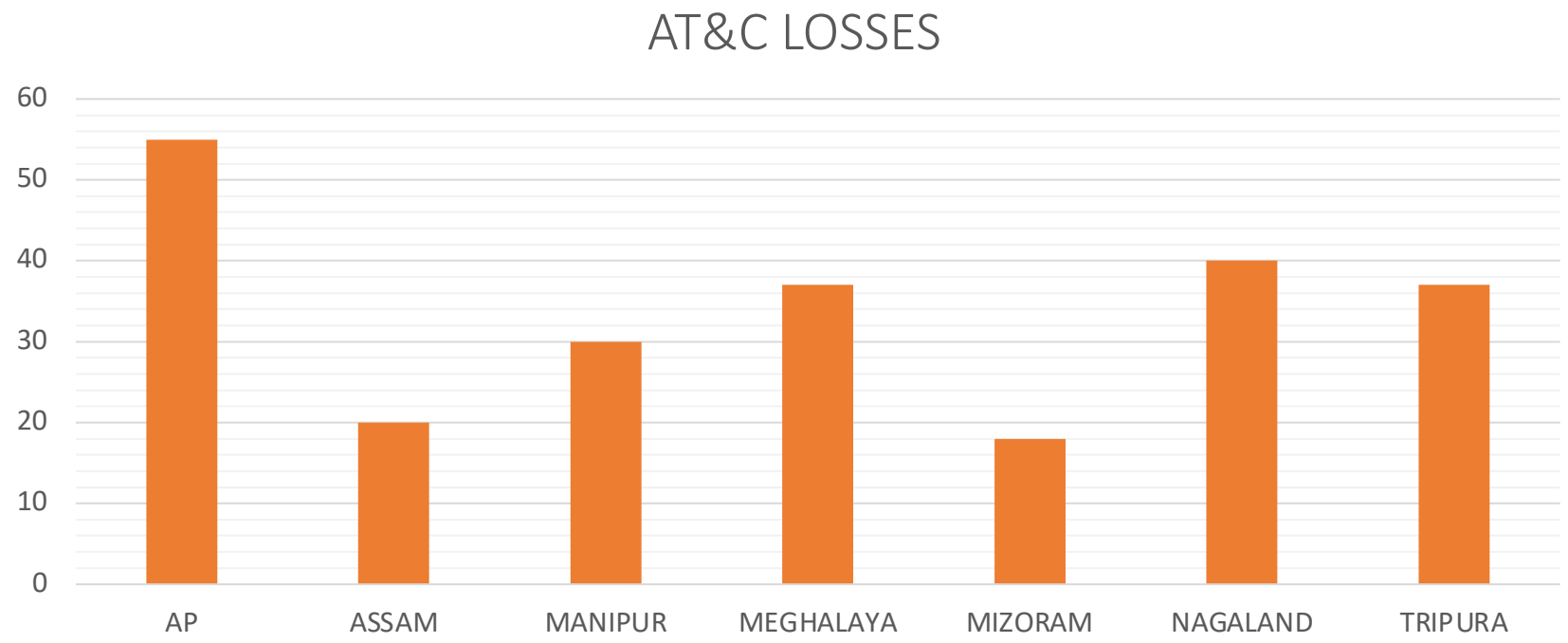


STATUS

		BILLING		POWER PROCUREMENT		REVENUE			PERFORMANCE
STATES	AT&C LOSSES	BILLING EFFICIENCY	COLLECTION EFFICIENCY	APPC	ACS	REVENUE FROM SALES	TARIFF SUBSIDY	ADJUSTED ARR	ACS-ARR GAP IN Rs./Kwh
AP	55.5	44.5	100	7.73	15.58	3.77	2.43	6.2	9.38
ASSAM	19.9	80.3	99.8	6.77	8.46	6.64	0.35	8.05	0.41
MANIPUR	29.8	74.1	94.71	6.68	8.27	4.13	2.99	8.13	0.14
MEGHALAYA	35.2	64.8	100	5.43	6.82	4.98	0	5.65	1.17
MIZORAM	16.2	83.8	100	5.92	8.9	4.95	2.54	7.49	1.41
NAGALAND	40.1	75	79.92	5.45	12.98	2.52	4.81	7.53	5.45
TRIPURA	35.5	68.3	94.43	4.15	5.14	5.03	0	5.22	-0.08

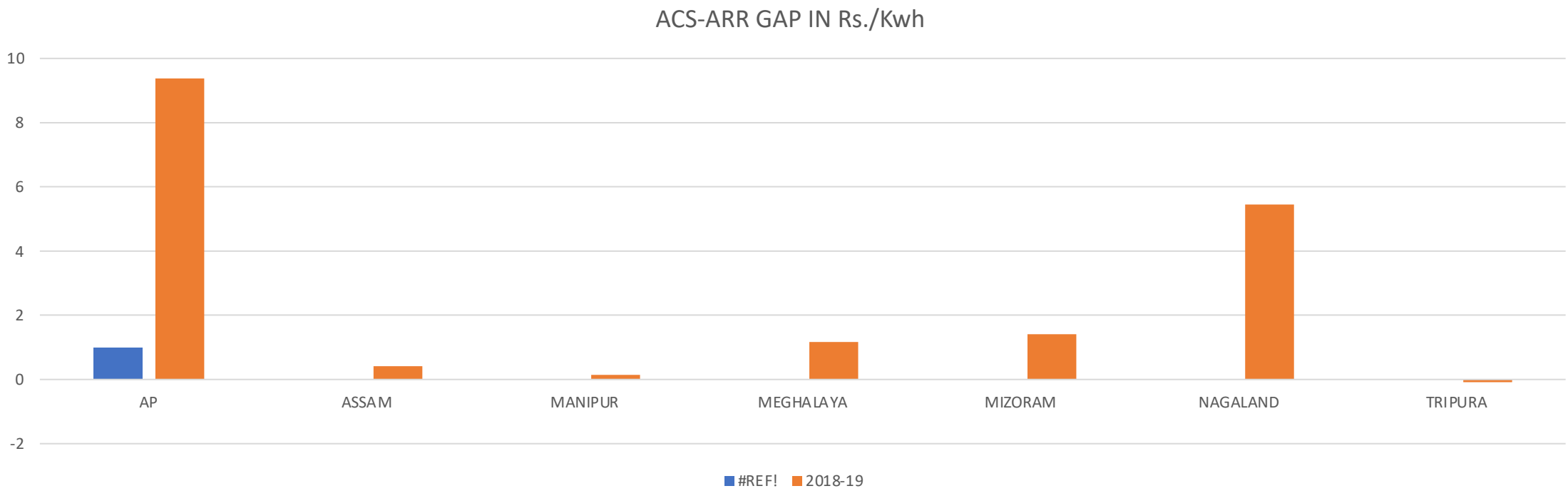
STATUS (OPERATIONAL PERFORMANCE)

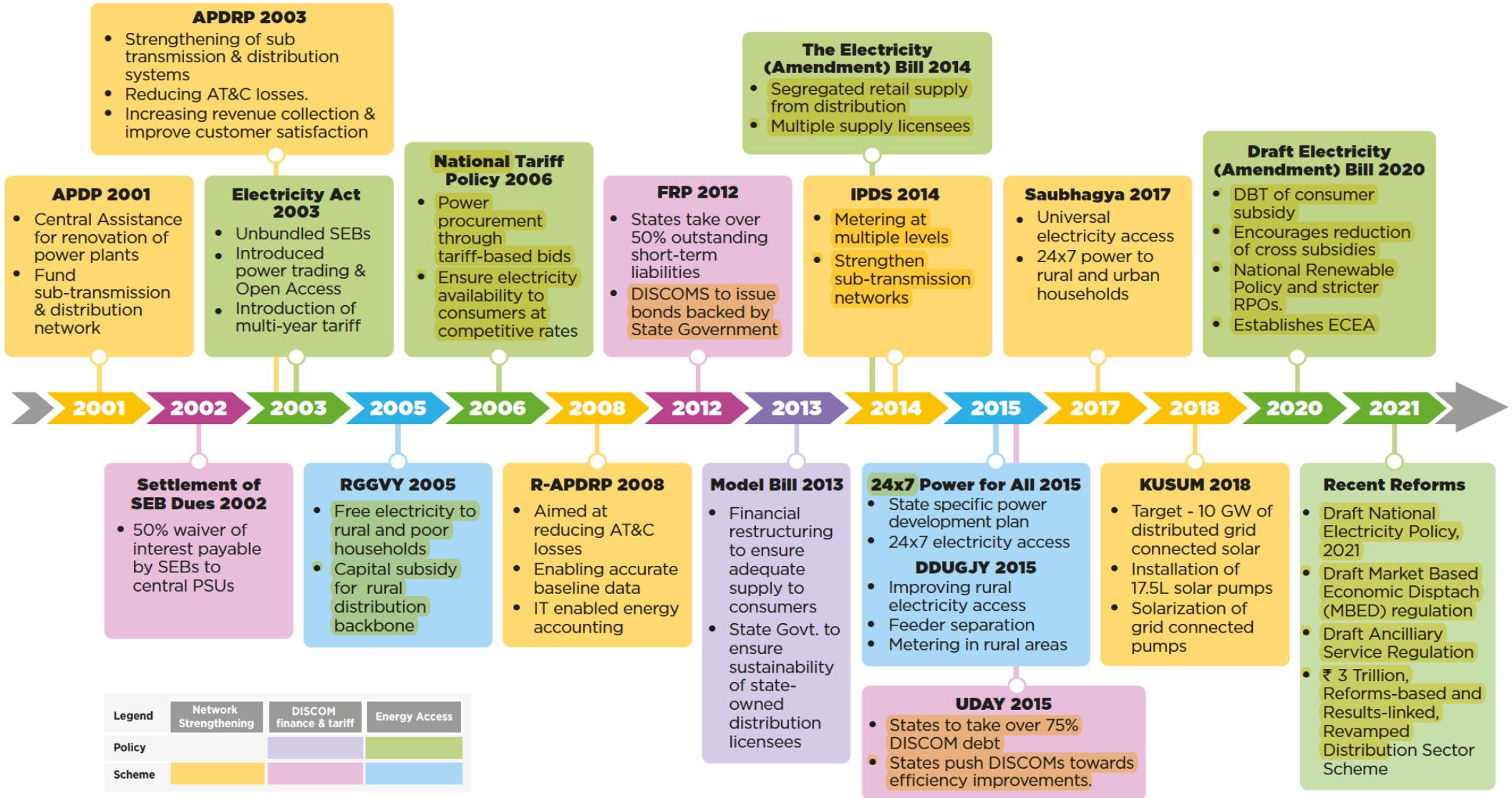
- AT&C LOSSES



STATUS (OPERATIONAL PERFORMANCE)

- ACS-ARR GAP





- APDP: Accelerated Power Development Programme
- APDRP: Accelerated Power Development and Reforms Programme;
- R-APDRP: Restructured APDRP
- RGGVY: Rajiv Gandhi Grameen Vidyutikaran Yojana
- IPDS: Integrated Power Development Scheme
- UDAY: Ujwal DISCOM Assurance Yojana
- ADITYA: Atal Distribution System Improvement Yojana

- DDUGJY: Deen Dayal Upadhyaya Gram Jyoti Yojana
- Saubhagya: Pradhan Mantri Sahaj Bijli Har Ghar Yojana
- KUSUM: PM Kisan Urja Suraksha evam Utthan Mahabhiyan
- RPOs: Renewable Purchase Obligations
- ECEA: Electricity Contract Enforcement Authority
- FRP: Financial Restructuring of State Distribution Companies
- Model Bill: Model State Electricity Distribution Management Responsibility

Structural Reforms

OWNERSHIP

- STATE OWNED
- DISTRIBUTION FRANCHISE MODEL
- DISTRIBUTION LICENSEE MODEL

Distribution Franchisee Model	Distribution Licensee Model
Private party has no ownership over the distribution grid assets.	Private party holds equity and is part or complete owner of the distribution grid assets.
Private party manages billing and revenue collection mainly.	Private party manages the distribution of power along with billing and revenue collection services.
Example – Torrent Power, Bhiwandi, MH	Example – TATA Power, New Delhi

VERTICAL UNBUNDLING

Vertically Integrated–Power Department	Transmission separation–GEDCO (Generation & Distribution Co)	Unbundled with Single Public Discoms	Unbundled with Multiple Public Discoms and/or Private Licensee / Franchisee	
Arunachal Pradesh	Himachal Pradesh	Assam*	Andhra Pradesh	Maharashtra*#
Goa	Kerala	Chhattisgarh	Bihar	Odisha*#
Jammu & Kashmir!	Manipur	Jharkhand	Delhi#	Rajasthan*
Mizoram	Punjab	Meghalaya*	Gujarat*#	Uttar Pradesh*#
Nagaland	Tamil Nadu	Uttarakhand	Haryana	West Bengal*#
Puducherry	Tripura*		Karnataka	
Sikkim			Madhya Pradesh*	

Note:

* *indicates presence of private franchisee model; # indicates presence of private licensee model,*

\# *J&K's GENCO was set up as a private limited company.*

HORIZONTAL UNBUNDLING

SHORT TERM POWER MARKETS

OPEN ACCESS

CONSUMER RETAIL CHOICES

Regulatory Reforms

STATE REGULATORY COMMISSION

- A study done by World Bank found that SERCs ability to carry out their mandate under EA 2003 with limited political interference has a significant positive association with profit per unit of electricity

Tariff setting

- Low electricity tariffs are not just an Indian problem. It is commonly observed in developing countries that electricity tariffs are rarely high enough to cover the full costs of service delivery. At the heart of the tariff rationalization debate is the tension between two different outlooks: is electricity an essential public service whose provision at low rates is essential for public welfare, or is it a commodity to be bought and sold in the market like any other?

Tariff Setting

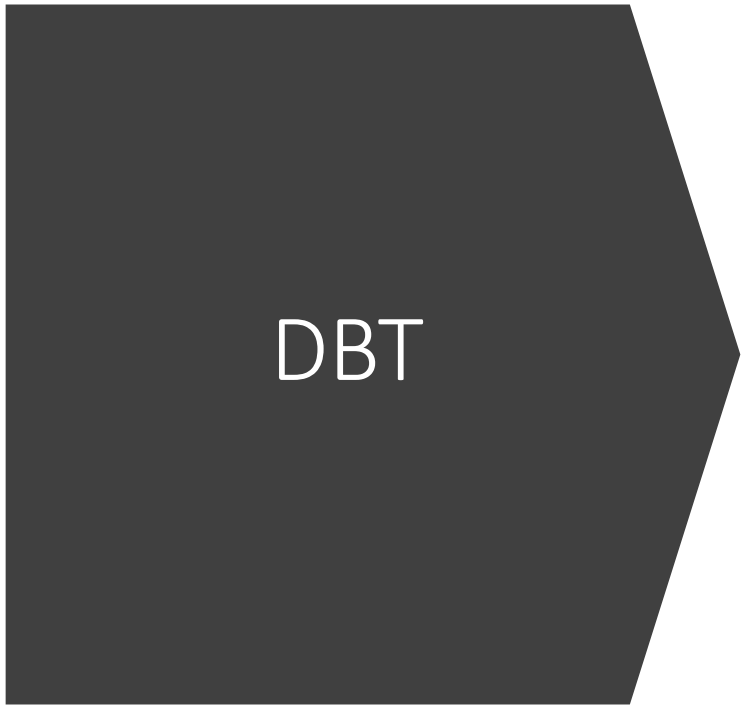
An aspect related to welfare is the growth in energy access. Although the Saubhagya scheme was successful in achieving 100 percent electrification by 2019, it expanded the base of low-paying customers on the grid which contributed to the rapid rise of the state-subsidy burden.

States such as Delhi and Gujarat[70] are good examples where tariff rationalisation has been carried out using the following principles:

- Adjusting the two-part tariff to accurately reflect the actual fixed and variable costs to prevent underrecovery of fixed costs.
- Quarterly tariff adjustments to ensure timely recovery of variable costs.
- Simplifying the tariff structure by minimising customer categories and tariff slabs.

Regulatory Assets

- Often SERCs do not increase tariffs to match the increasing costs of discoms, in order to shield consumers from tariff shocks. The higher costs have to be absorbed by discoms. However, they are recognised by the regulator as regulatory assets, to be recovered through future tariff hikes. The appellate tribunal had earlier ruled that regulatory assets must be recovered over three years. However, the magnitude of the assets could cause a major tariff shock. Therefore, the recovery was spread over a longer period, with no relief to discom finances.
- Mounting regulatory assets create cash-flow problems for discoms, forcing them to borrow funds to cover the revenue deficit.



Solution Option	Technical Issues Addressed	Business Issues Addressed	Managerial Issues Addressed
DBT & cost rationalisation of tariff		• Cost-reflective tariffs • Revenue realisation • High-cross subsidy	

Benefit to Discoms

- DBT increases discom revenues realised through cost-reflective tariffs and bills that are paid on time. Further, DBT can decrease the cost of service by enabling discoms and customers to optimise demand to match lower cost supply through ToD rates and more advanced tariff programmes.
- **Efficiency:** DBT allows discoms to send proper price signals to large numbers of customers that can result in more efficient use of resources and create opportunity to use time and location-based price signals to optimise operations and increase efficiency.
- **Discom Finance:** DBT will eliminate large delays in discom revenue if state governments are able to deposit subsidy into accounts on a timely manner.

How to make it work

- **Discoms:** Installing meters and implementing billing programmes are required to capture the full set of benefits that DBT provides for discoms.
- **Discoms and SERCs:** To capture the major benefits of DBT, the transition of subsidy must be implemented in a parallel manner with revised tariffs and a new paradigm of annual tariff revision to match cost and inflation. This could also include a reassessment of customer's willingness to pay.
- **State Government:** The livelihood of the end customer receiving DBT will be dependent on the timeliness of the DBT being funded. If funds are deposited directly to the customer's account managed by the discom, it is necessary that considerations be made on if and when to disconnect power to the customer if the state delays DBT payment. If delays in DBT funding happen, the financial stress is moved from the discom to the customer which is not the intended outcome.

Operational Reforms

OPERATIONAL REFORMS

POWER PROCUREMENT COST OPTIMIZATION

METERING AND BILLING

COLLECTION EFFICIENCY

DYNAMIC TARIFF AND DEMAND SIDE MANAGEMENT

UPGRADING DISTRIBUTION INFRA

OPERATIONAL REFORMS

- **Reducing power procurement costs:** Discoms should optimise their power purchase by procuring from the markets as suitable, and they should be rewarded for efficiency gains from the use of the market. The discoms should develop the human resources and daily liquidity that are required to use this relatively new facility. As long as the markets continue to provide low-cost power, discoms should not sign new expensive long-term thermal PPAs. States such as Chhattisgarh, Gujarat, Maharashtra, and Uttar Pradesh have banned new thermal PPAs till 2022. Discoms should use ToD tariffs to incentivise changes in demand patterns. Dynamic tariffs, enabled by advanced metering and a smart grid, can reduce power purchase costs and help manage peak loads.
- **Billing efficiency:** Many discoms need to improve their billing efficiency through better metering. They should fully utilise the revamped central government reform scheme to achieve 100 percent metering using prepaid/smart meters while being careful of guarding against cybersecurity threats.
- **Collection efficiency:** Discoms should target 100 percent collection efficiency. Theft can be reduced through concerted action by the discom and the state. Prepaid metering can help reduce pilferage and increase collection, as demonstrated in Manipur. Many state government departments and municipalities are also major defaulters in payments**.** Discoms should follow up tenaciously to collect current bills as well as arrears.

OPERATIONAL REFORMS

- **Reduce technical losses:** Discoms may reduce their technical losses through investment by improving their grid (including upgrading conductors, high-tension lines, and right-sizing transformers) and through the implementation of appropriate monitoring technologies, as was done effectively in Gujarat. This is expected to be a major component of the revamped central government reform scheme announced in the Budget, and the state discoms should aggressively use this support to upgrade their distribution infrastructure.
- **Agricultural demand management:** States with large rural or agricultural consumer bases such as Rajasthan, Andhra Pradesh, Gujarat, Karnataka and Maharashtra have benefited from separating feeders for agricultural use from non-agricultural use. Investment in feeder separation has been encouraged by the government at the Centre through DDUGJY. Further, solar pump deployment has also received a push through PM-KUSUM scheme. Discoms can significantly improve their financial situation by encouraging the use of solar pumps for agriculture.

Solutions for RE Integrati

REGIONAL INTERCONNECTION AND BALANCING

- As the peakier demand curve across the country and the intermittency of RE power generation cross paths, it can lead to a significant supply–demand mismatch. Hence, increasing coordination and trading between balancing areas will increase the efficiency of energy flow across the network, improve economic efficiency of power procurement, and enable better integration of variable renewable generators.

RE FORECASTING

Box 7: International experience in RE forecasting[111]

The German power sector hosts more than 75 GW of solar and wind power today. Germany has bestowed a 'must-run' status upon renewables, like India. But unlike in India, where RE power producers are expected to submit RE forecasts and are penalised for deviation in forecasts, in Germany the Transmission System Operators (TSOs) manage RE forecasting activities, relieving the power producers from submitting their individual forecasts.

The TSOs have built expertise in forecasting by leveraging meteorologists. They are capable of evaluating various forecasts and deploying post-processing schemes based on different forecast service providers. TSOs leverage several RE forecasts from different providers to increase knowledge about forecast uncertainty.

A similar model is witnessed in Australia where the Australian Energy Market Operator (AEMO) runs the state-of-the-art Anemos platform, one of the best power prediction systems for renewable energy. The prediction platform allows the incorporation of several RE forecast models from various providers.

Solution Option	Technical Issues Addressed	Business Issues Addressed	Managerial Issues Addressed
Advanced RE planning and forecasting	• RE curtailment • System congestion • Grid outages	• High APPC	• Near and long-term planning • RE purchase obligation

Benefits to Discoms

- Power Procurement Cost: As RE generators are deemed with a 'must-run' status, inaccurate forecasting of RE generation can disturb the merit order dispatch of power plants for the discom which can increase the overall cost of power procured.
- DSM Penalty: Inaccurate forecasts in RE generation can lead to an over or underestimation of the actual power generated. If RE generation is lower than forecasted, discoms are forced to overdraw from generators inducing a DSM penalty.
- Grid Disturbances and Outages: Large errors in RE forecasting can lead to real-time mismatch between power supply and demand and force discoms to induce grid outages.

How to make it work?

- **Discoms:** Develop an approach to increase the visibility of distributed PV and create a methodology for including behind-the-meter RTS into discoms and LDCs operation plans.
- **SERCs and Discoms:** Introduce Artificial Intelligence based advanced weather forecasting tools to improve the accuracy of day-ahead and real-time renewable energy production.

DECENTRALIZED RENEWABLE ENERGY

CHALLENGES OF DECENTRALIZED RENEWABLE ENERGY

- Discoms perceive the rising RTS adoption/captive generation and use of OA market among C&I customers as unfavourable since they form the bulk of their revenue stream.
- Further, discoms prefer gross metering over net metering[xii] for smaller consumers since the tariff differential in gross metering could potentially mitigate some of their lost revenue.
- Even with policy changes that enable integration of mini and micro grids into the central grid, discoms will still need to set up the required interconnections as well as pay the necessary feed-in-tariffs[xiii] to mini-grid developers.[113],[114] Introduction of variable renewable energy to the grid may also require discoms to deal with congestion/accommodate surplus electricity on the grid during low demand. This can lead to curtailment of solar/RE projects violating the 'must-run' clause they carry. This can discourage existing and potential solar/ RE developers.

MINI GRIDS

Box 8: Bihar's mini-grid story – an alternate way to provide electricity in rural India[118,119,120,121,122,123]

Although India achieved 100% household electrification in 2019, 37 percent of the rural households in Bihar lack access to reliable electricity. Mini-grids are seen as dependable alternative sources of power in the state, with over 8 percent of the nation's mini-grids found in Bihar. The state's policy aims to build on this momentum and install a further 100MW of sub 500kW renewable-based mini-grids. Private energy service companies (ESCOs), such as Husk Power, have been leading the way in the state.

Husk Power relies on establishing a base demand through anchor loads such as agricultural facilities, telecom towers, or similar industrial users, which improve the utilisation rate for the mini-grid, reducing the average cost of supply.

Tariffs set by Husk Power are cost-reflective and offer no subsidies, allowing for tariff setting at the mutual discretion of the developer and consumers. Despite higher tariffs as compared to centralised grids (which are now available where mini-grids operate), most customers are happy to pay the premium for a reliable supply of electricity.

For example, Husk Power's 32kW biomass-solar hybrid plant near Piprakothi in Bihar, continues to serve 250 customers despite grid extensions in the area. Hence, despite fears that insufficient regulations and uncertainty about grid arrival might deter investment, Husk Power managed to raise ₹2 crore in 2018.

To prevent mini-grids from becoming stranded assets due to the expansion of the centralised grid, the state policy has laid out a number of options for developers, including continued operation in parallel with the grid, selling power to the discom at a regulator-determined feed-in tariff, transferring ownership of assets and network to the discom and engaging with the discom as a distribution franchisee.

Husk Power's success is also attributed to its use of smart technology, such as remote monitoring of mini- grids and mobile-enabled smart prepaid meters with a 'pay-as-you-go' system suited for customers with irregular income streams.

Husk Power's story in Bihar reinforces the consumers' willingness to pay greater tariffs for electricity that is more reliable. It also reinforces the importance of support from the government via relevant reforms and policies.

Managerial Reforms

Managerial Reforms

- Vision & Leadership
- Customer facilitation
- Employee incentives and worker protection

- Discoms should take proactive steps to improve customer relations. Easily accessible call centres, convenient bill payment facilities, and accurate billing can help reduce customer dissatisfaction and increase revenue.
- Energetic and enthusiastic employees are key to the financial and operational success of a discom. Performance incentives should be designed to align the employees with the interests of the organisation. Zones or circles in the discom could be treated as profit centres, with the employees given commensurate autonomy as well as responsibilities. This can bring in a sense of ownership among employees about running the business profitably.
- The operation and management of the power distribution business are quite complex. They require expertise in a variety of fields: engineering, finance, billing and collection, human resources, administration, etc. Some organisations have been established to provide training (such as the National Power Training Institute, and the Tata Power DDL Learning Centre). There is a need to augment the capacity to provide training in these fields.

Best Practices (SPECIAL MENTION)

States	Best Practices	Key Takeaways
Manipur, public licensee[138]	**AT&C loss trajectory**: 52% in 2015-16 to 29.8% in 2018-19 **ACS-ARR Gap** (₹ /kWh): 0.50 in 2015-16 to 0.10 in 2018-19 **Profitability** (₹ Crores): -45 in 2015-16 to -19 in 2018-19 **Initial Measures**: Unbundling and corporatisation initiated in 2015 **Institutional Measures:** Controlled energy theft using special courts and police forces; detection and disconnection of unauthorised connections and tapping; Community participation to improve O&M including theft prevention **Management Measures**: Instituting new processes and mechanisms such as project review training, frameworks, data flow, division-wise and MD-level dashboards for monitoring project performance; establishing structural and role accountability via periodic reviews at the field level **Technology Measures:** Installed prepaid meters; computerised billing and revenue collection; integrated feeder-wise performance monitoring systems, installing aerial bunched cables for LT connections, sealed meters to check tampering	Improved power availability and supply through improving O&M measures Prepaid metering was supplemented with improved power supply resulting in improved billing and collection efficiency as well as lower commercial losses

CONCLUSION

The Indian power sector is one of the largest and most complicated in the world. External expertise, structural frameworks, and new technology are required but they are not sufficient to drive India's power sector transition. Similarly, a push to retail choice through separation of content and carriage may not necessarily result in the full set of theoretical benefits touted.

One key lesson from the history of the power sector in India is that the country is too large and diverse for a one-size-fits-all approach. A flexible and home-grown approach to reform, which is supported by state and central political will, and which allows for 'learning by doing', will be instrumental in determining the success of reforms.