

Power System Operation Corporation Ltd.

39th TCC Meeting



ER Grid Performances

ER Grid Performance July - 18 to October-18



Presentation outline:

- **Frequency Profile**
- **Demand / Energy met**
- **Generation pattern**
- **Transnational Exchanges**
- **Eastern-Regional Export Profile**
- **Overdrawal of Odisha, DVC & West Bengal**
- **Hydro generation pattern of Odisha & Tala**
- **Major Transmission element addition and outage status of transmission elements**
- **Challenges ahead and Issues**

Frequency Profile

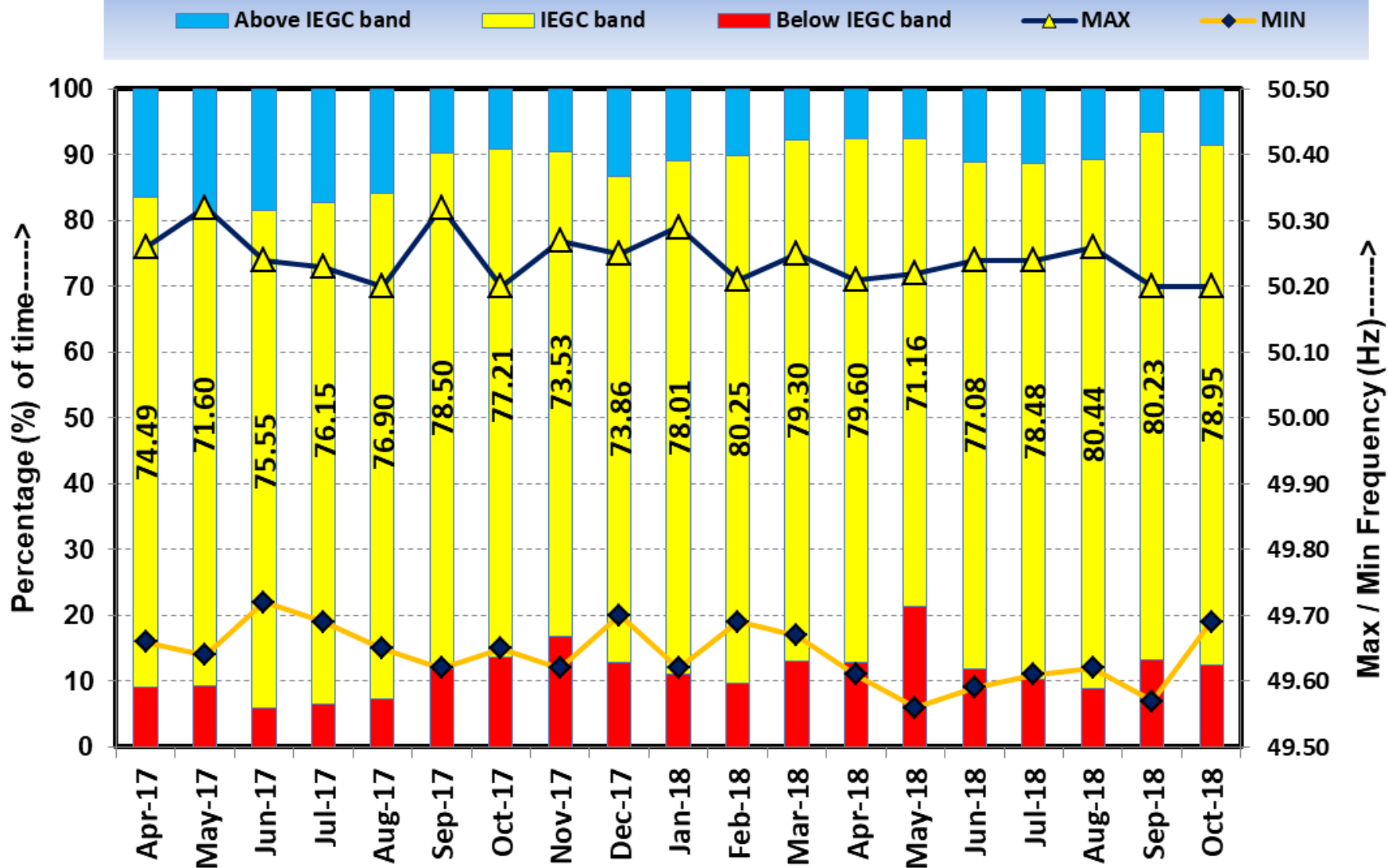
Highlights of Frequency Profile (Jul-18 to Oct'18)




Inst.		Inst.		% AGE OF TIME IN DIFFERENT FREQUENCY BLOCK							
	Max		Min		Avg.	FVI	Avg (%)	Avg (%)	Avg (%)	With in IEGC band	
	Freq (Hz)	Date	Freq (Hz)	Date	Freq. (Hz)		<49.9	49.9-50.05	>50.05	Max (%)	Date
Jul-18	50.24	24-Jul-18	49.61	19-Jul-18	49.98	0.043	10.25	78.48	11.28	86.00	15-Jul-18
Aug-18	50.26	06-Aug-18	49.62	28-Aug-18	49.97	0.039	8.92	80.44	10.64	88.40	06-Aug-18
Sep-18	50.20	22-Sep-18	49.57	24-Sep-18	49.97	0.050	13.20	80.23	6.56	89.20	03-Sep-18
Oct-18	50.20	05-Oct-18	49.69	20-Oct-18	49.97	0.046	12.47	78.95	8.58	87.00	03-Oct-18

Frequency Profile

Max: 50.32 Hz; Min: 49.56 Hz; Avg: 49.98 Hz;

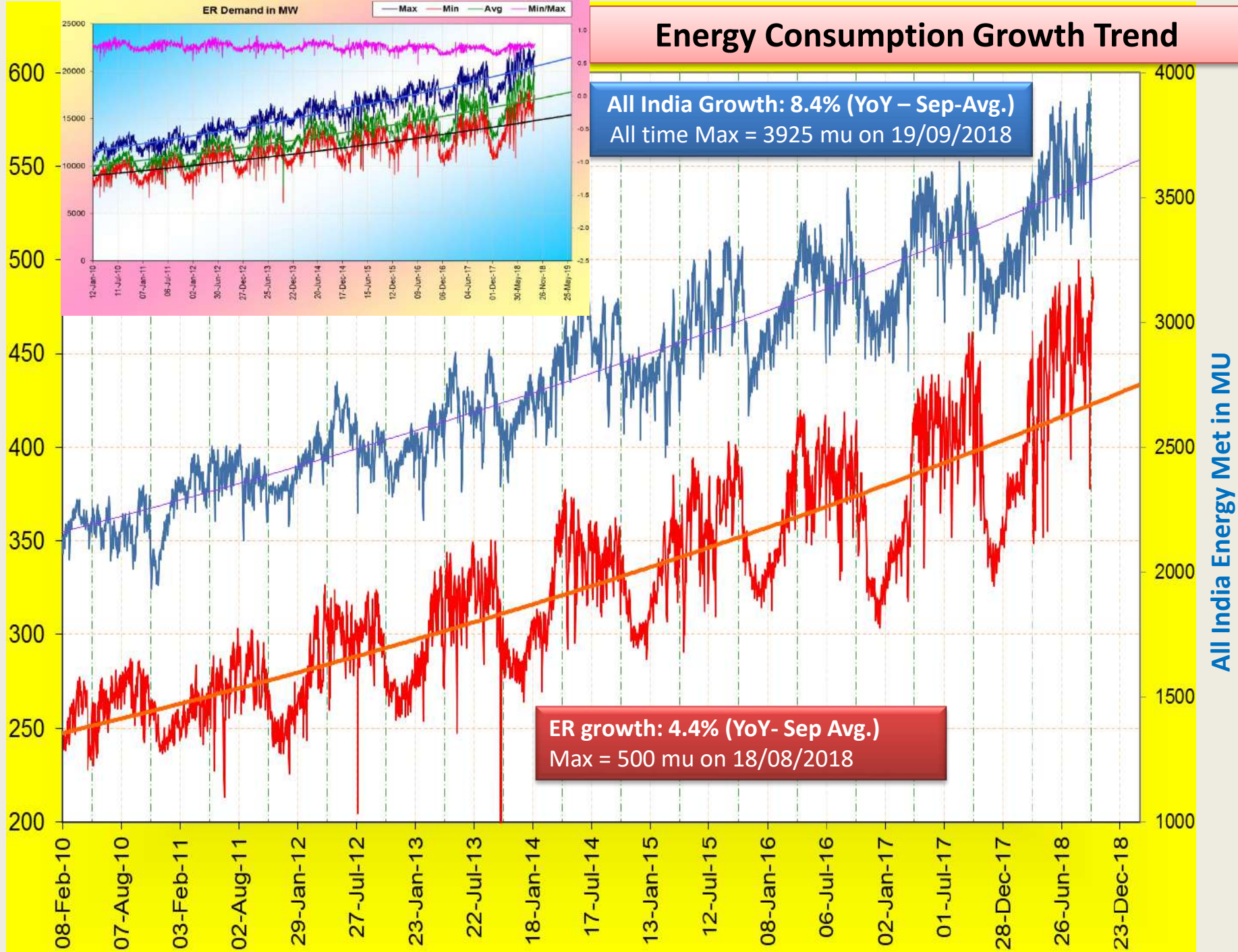


Demand / Energy Consumption Pattern

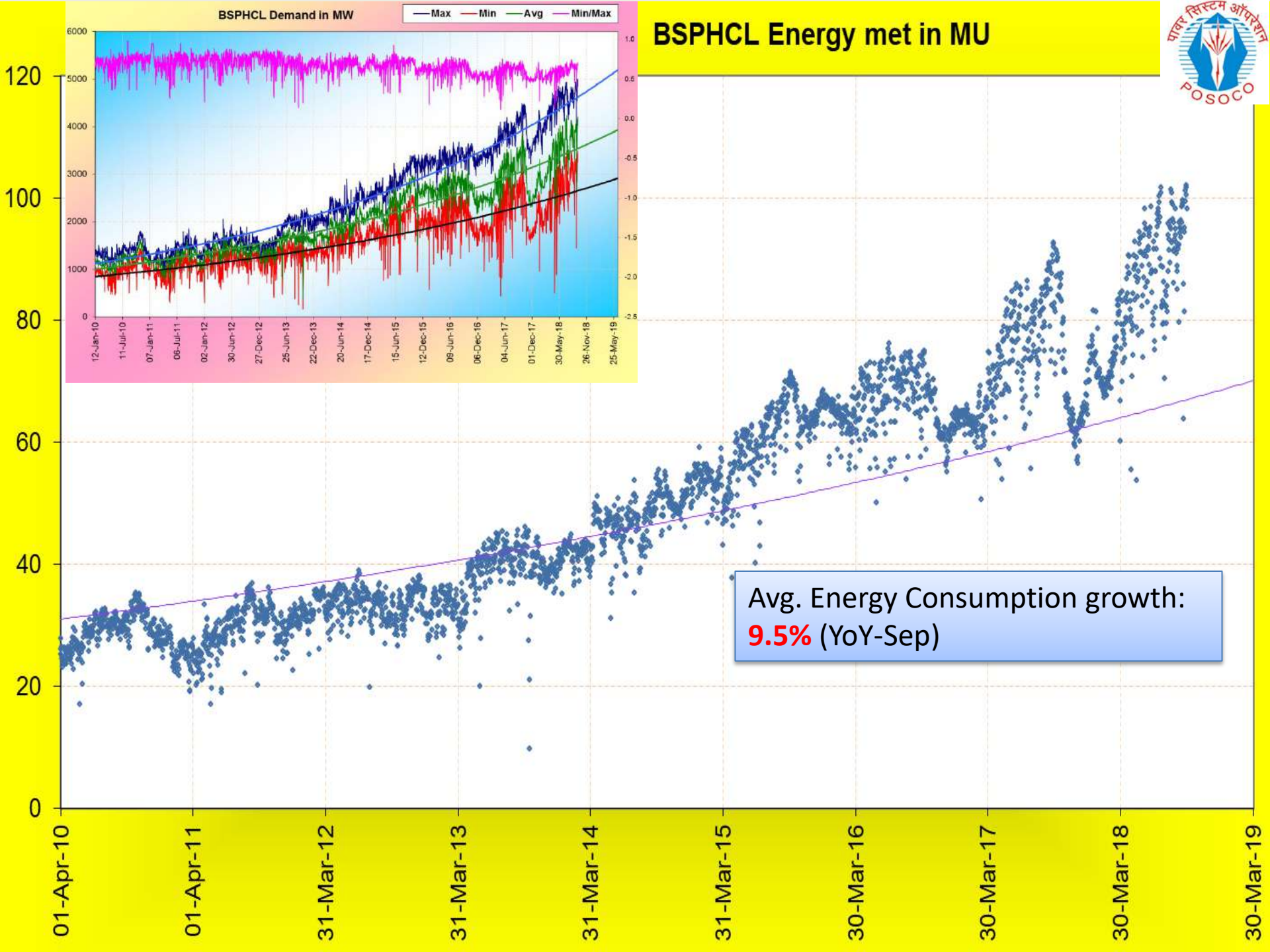
So Far Highest Demand				
Region	Energy consumption (MUs)	Date	Demand (MW)	Date
ALL INDIA	3925	19-Sep-18	175590	18-Sep-18
NR	1421	10-Jul-18	64797	25-Aug-18
WR	1293	16-Oct-18	58081	16-Oct-18
SR	1080	29-Mar-18	48317	19-Apr-18
ER	499.8	18-Aug-18	23030	03-Oct-18
NER	55	19-Jul-18	2953	07-Jul-18
Constituent	Energy consumption (MUs)	Date	Demand (MW)	Date
Bihar	104.0	02-Oct-18	5011	12-July-18
DVC	75.8	12-July-18	3536	12-July-18
Jharkhand	27.8	19-May-18	1319	19-May-18
Odisha	123.5	02-Oct-18	5558	23-Aug-18
West Bengal	192.6	05-Oct-18	8896	18-June-18
Sikkim	2.1	07-Dec-17	117	28-Oct-16
ER	499.8	18-Aug-18	23030	03-Oct-18

Energy Consumption Growth Trend

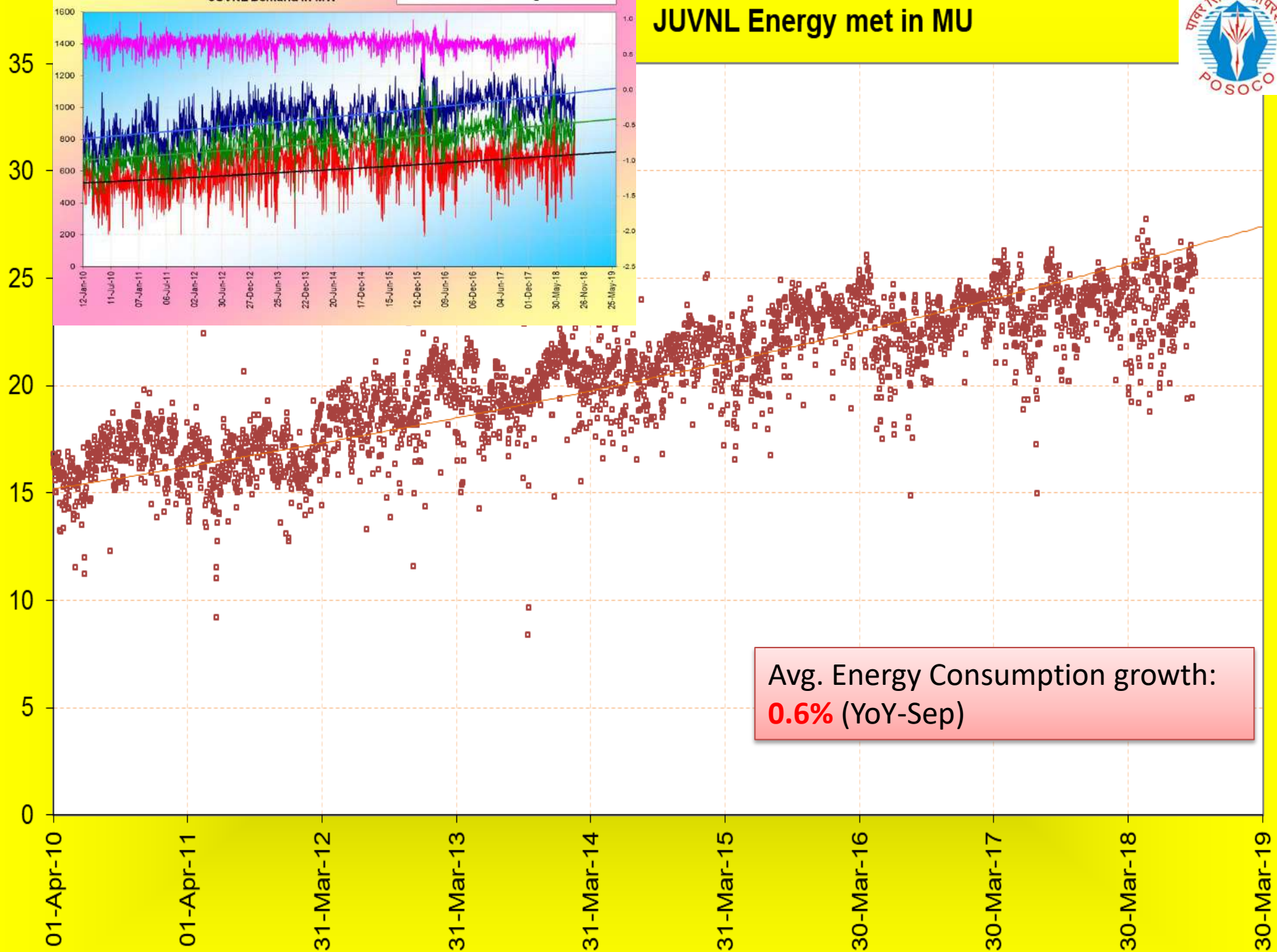
Eastern Region Energy Met in MU



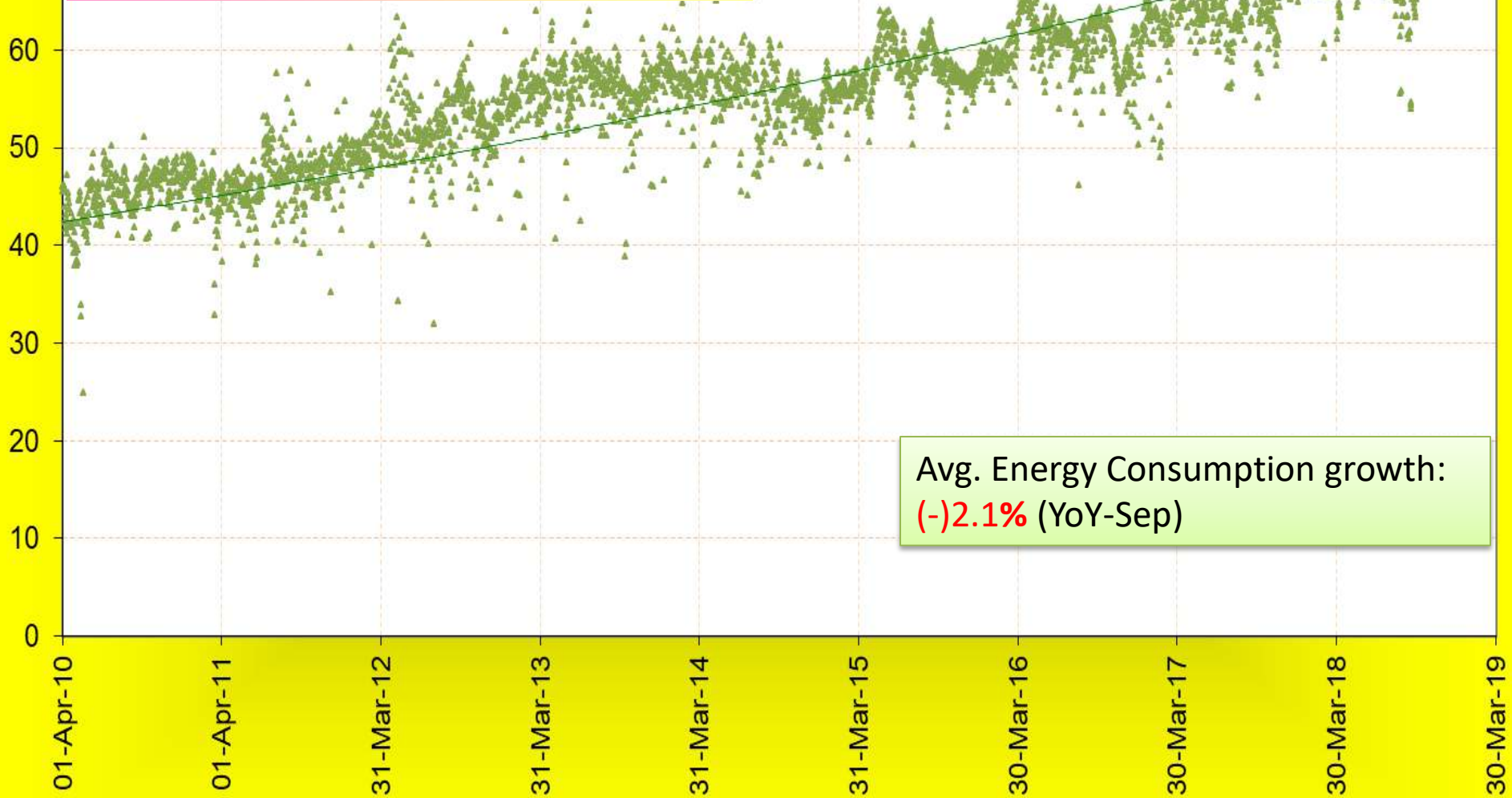
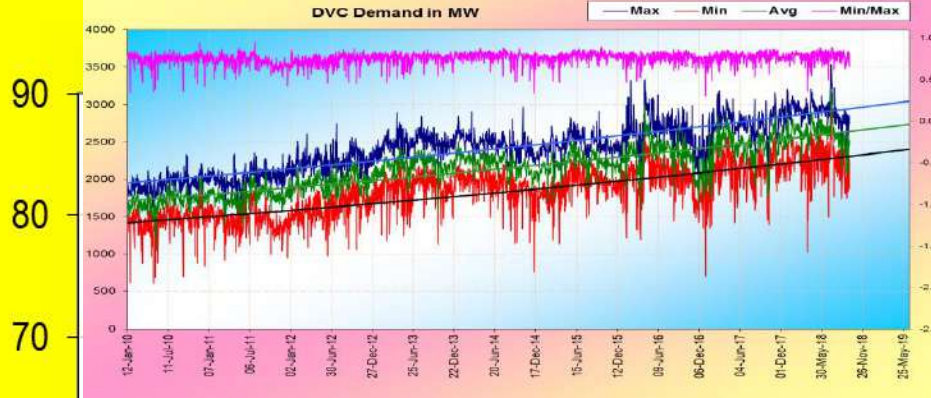
BSPHCL Energy met in MU



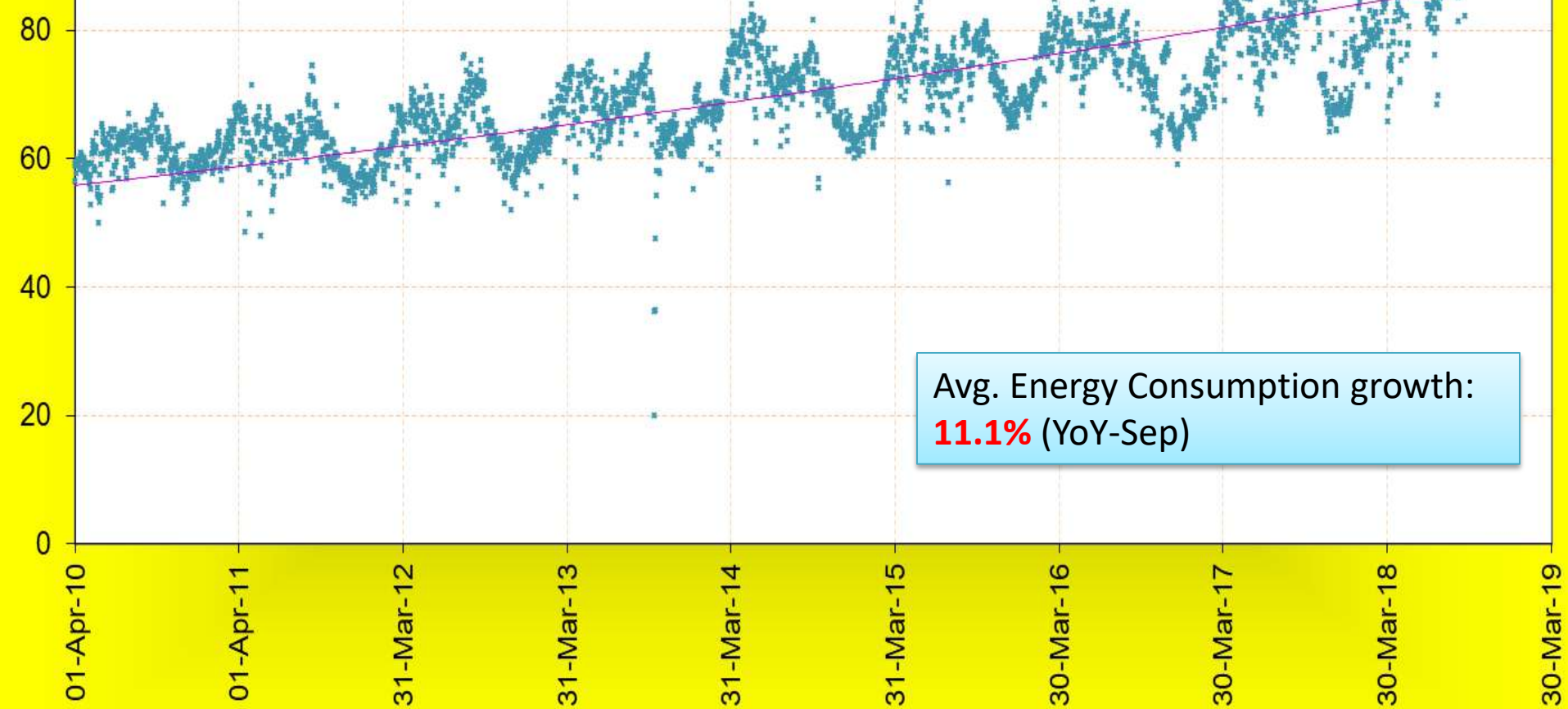
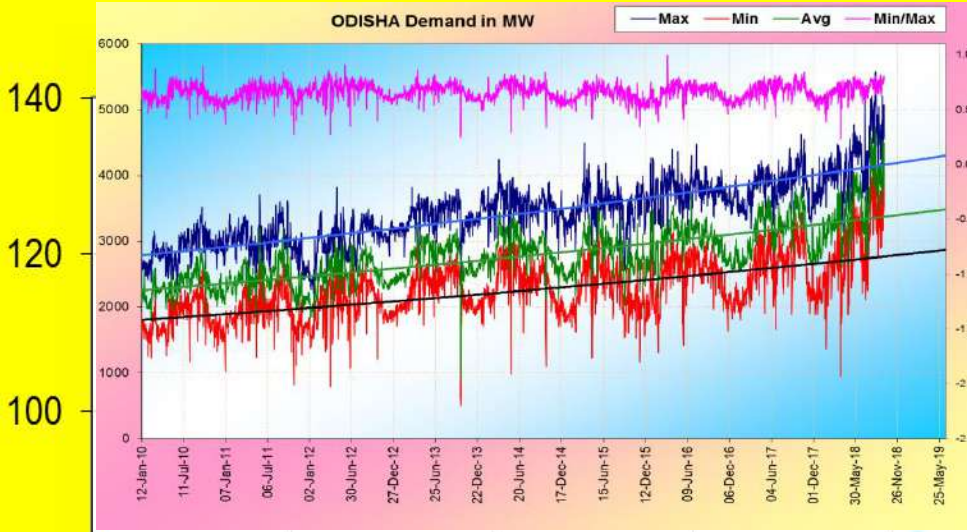
JUVNL Energy met in MU



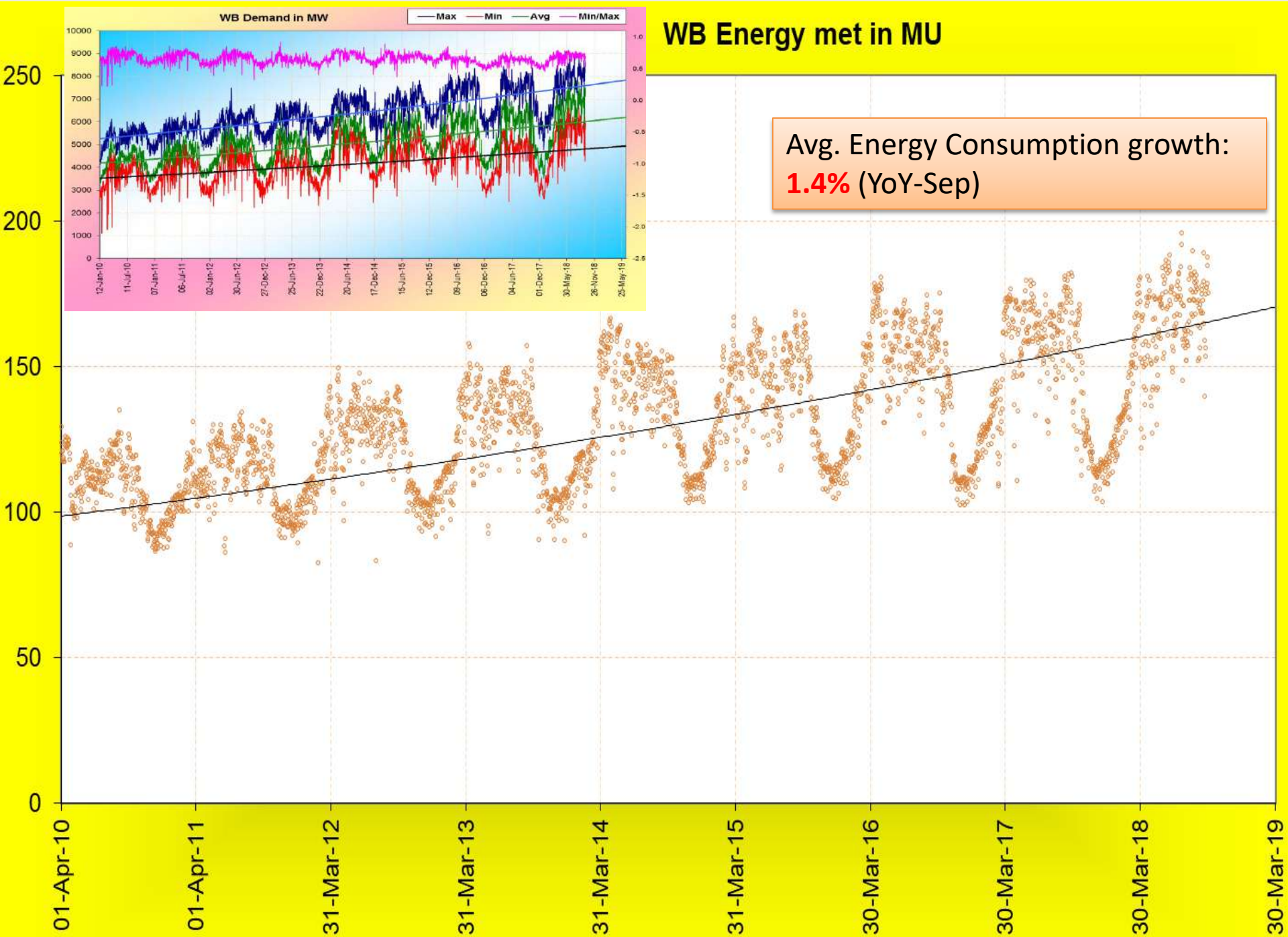
DVC Energy met in MU



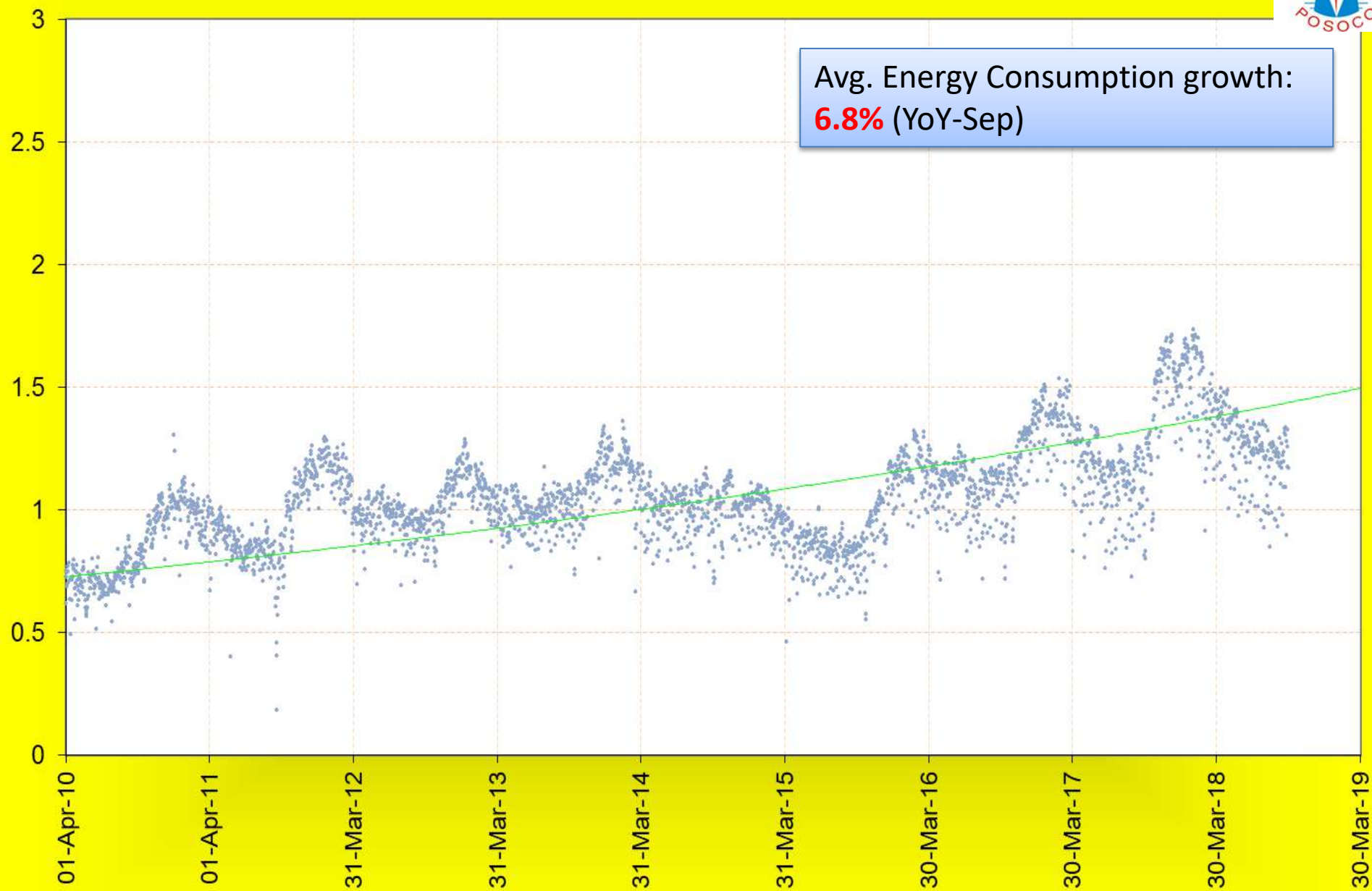
Odisha Energy met in MU



Avg. Energy Consumption growth:
11.1% (YoY-Sep)



Sikkim Energy met in MU

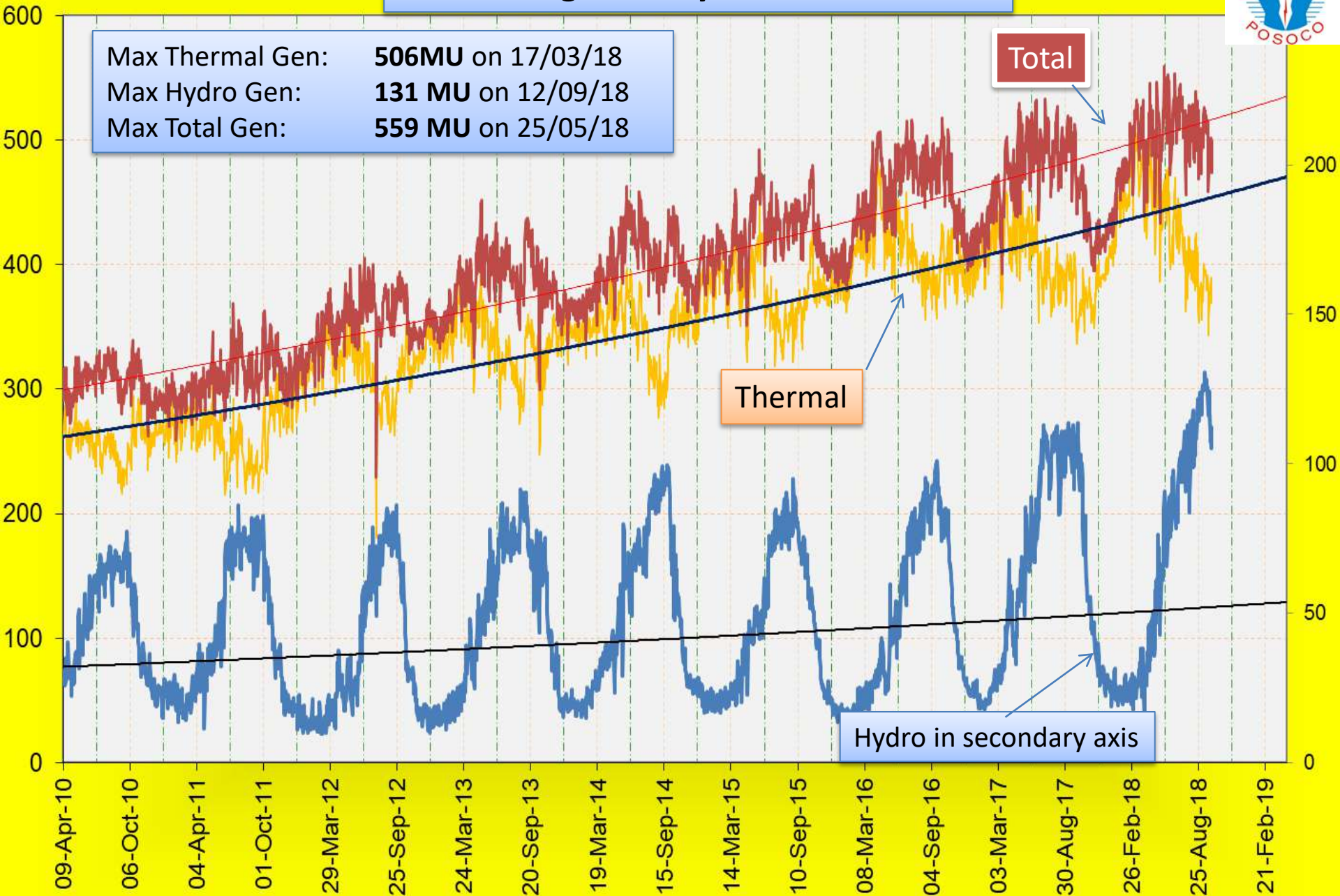


Generation pattern

Eastern Region Daily Generation in MU

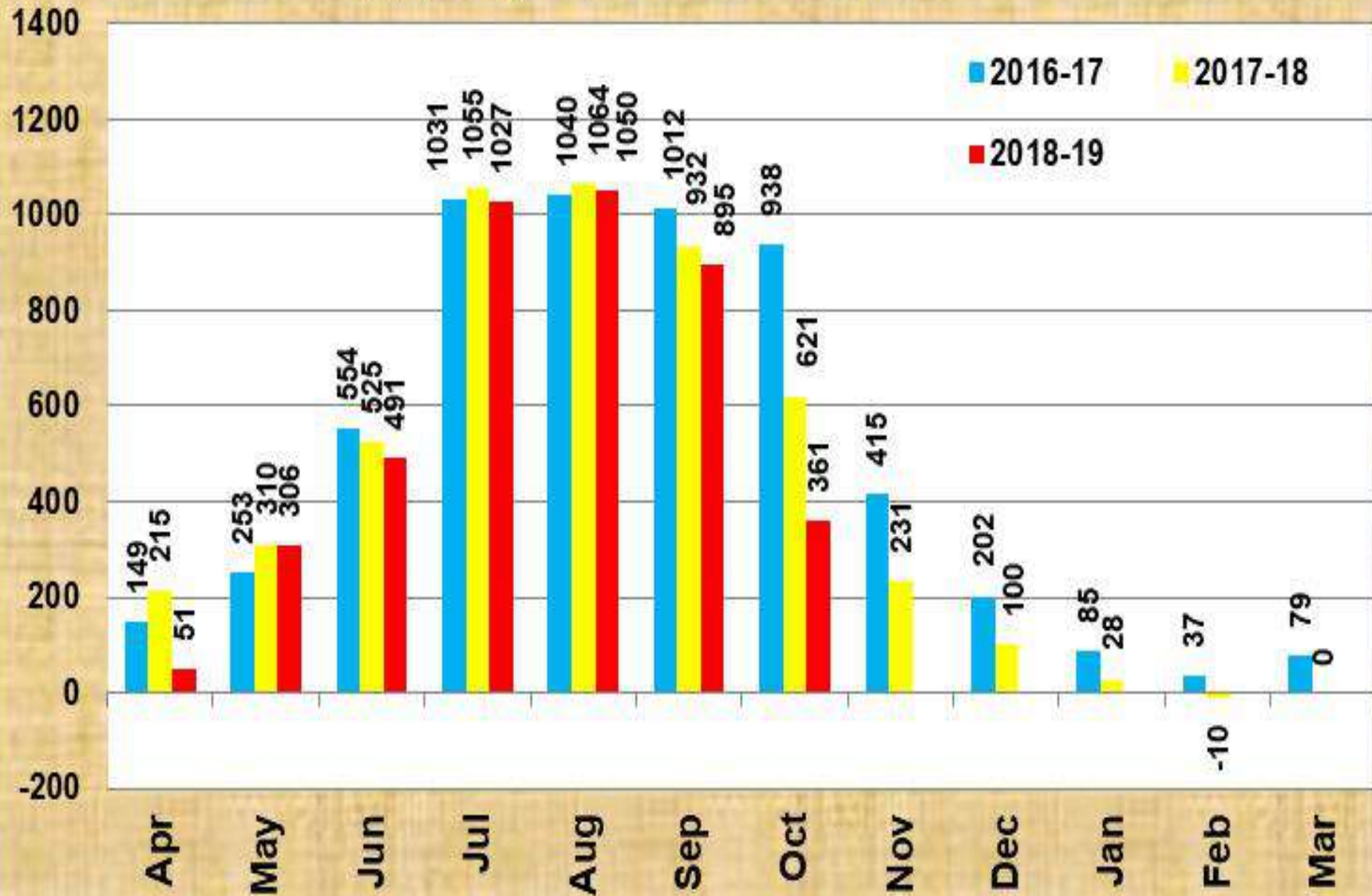


Max Thermal Gen: **506MU** on 17/03/18
Max Hydro Gen: **131 MU** on 12/09/18
Max Total Gen: **559 MU** on 25/05/18



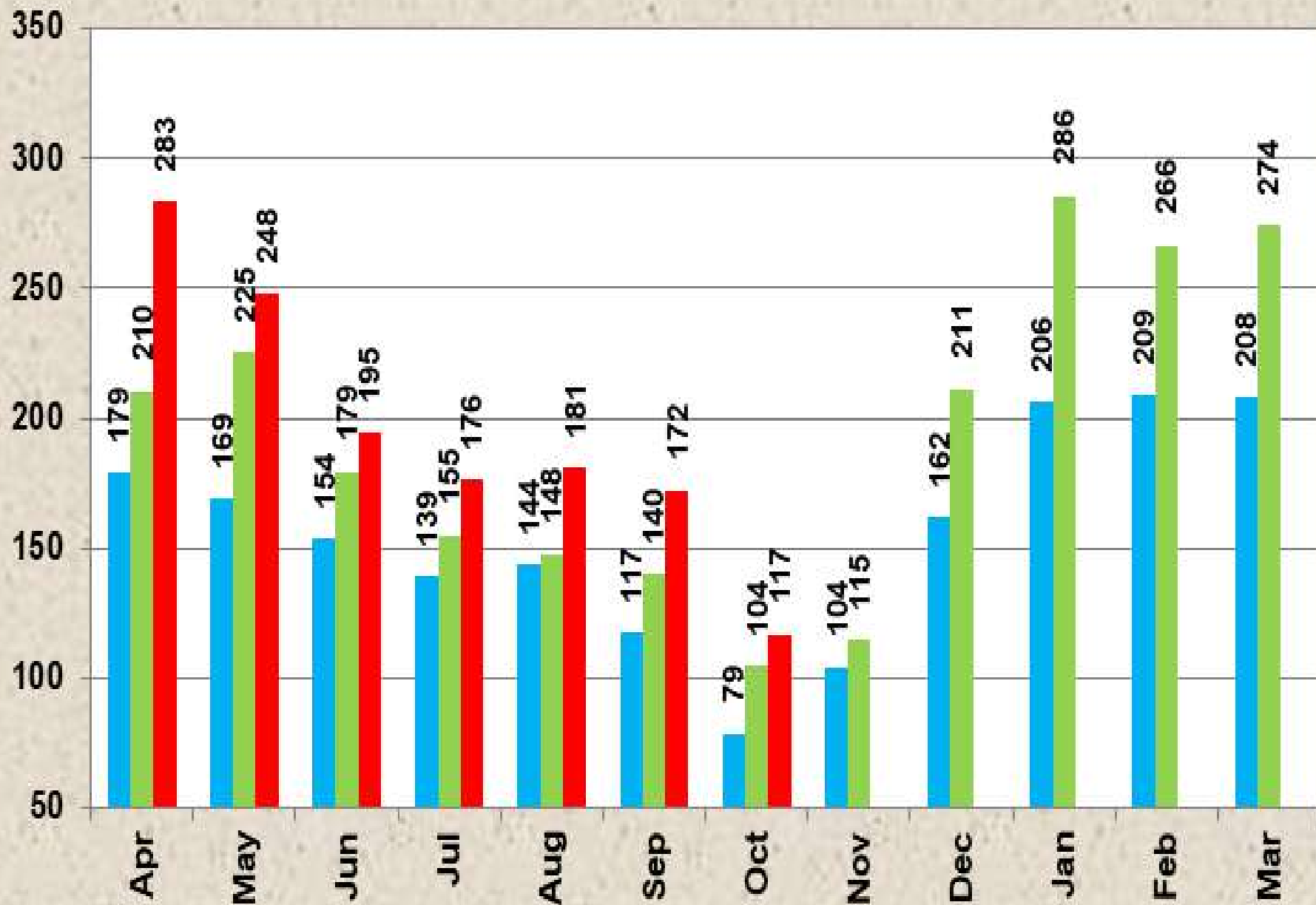
Transnational Exchange

Net Energy (MU) Import from Bhutan



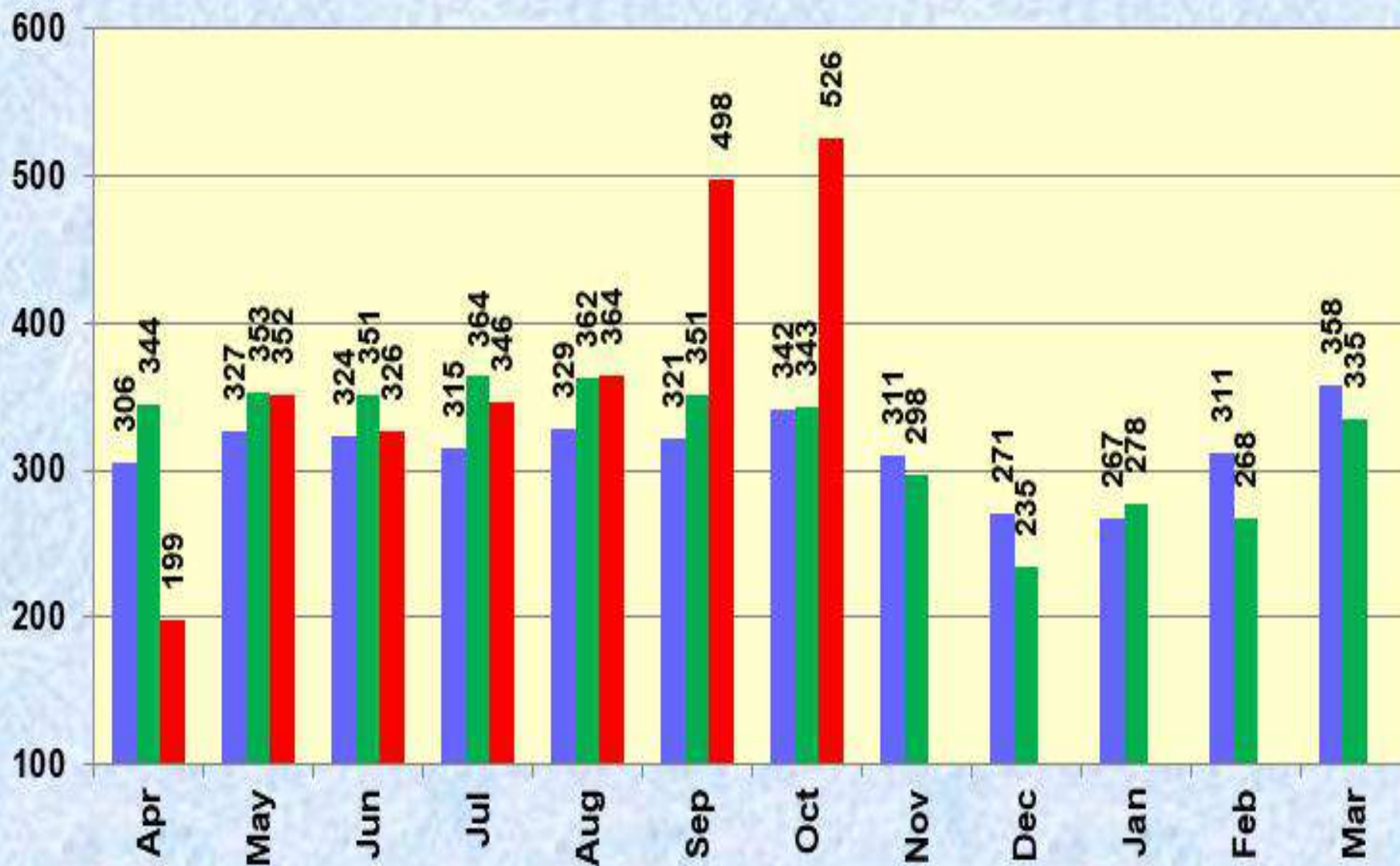
Net Energy (MU) Export to Nepal

2016-17 2017-18 2018-19



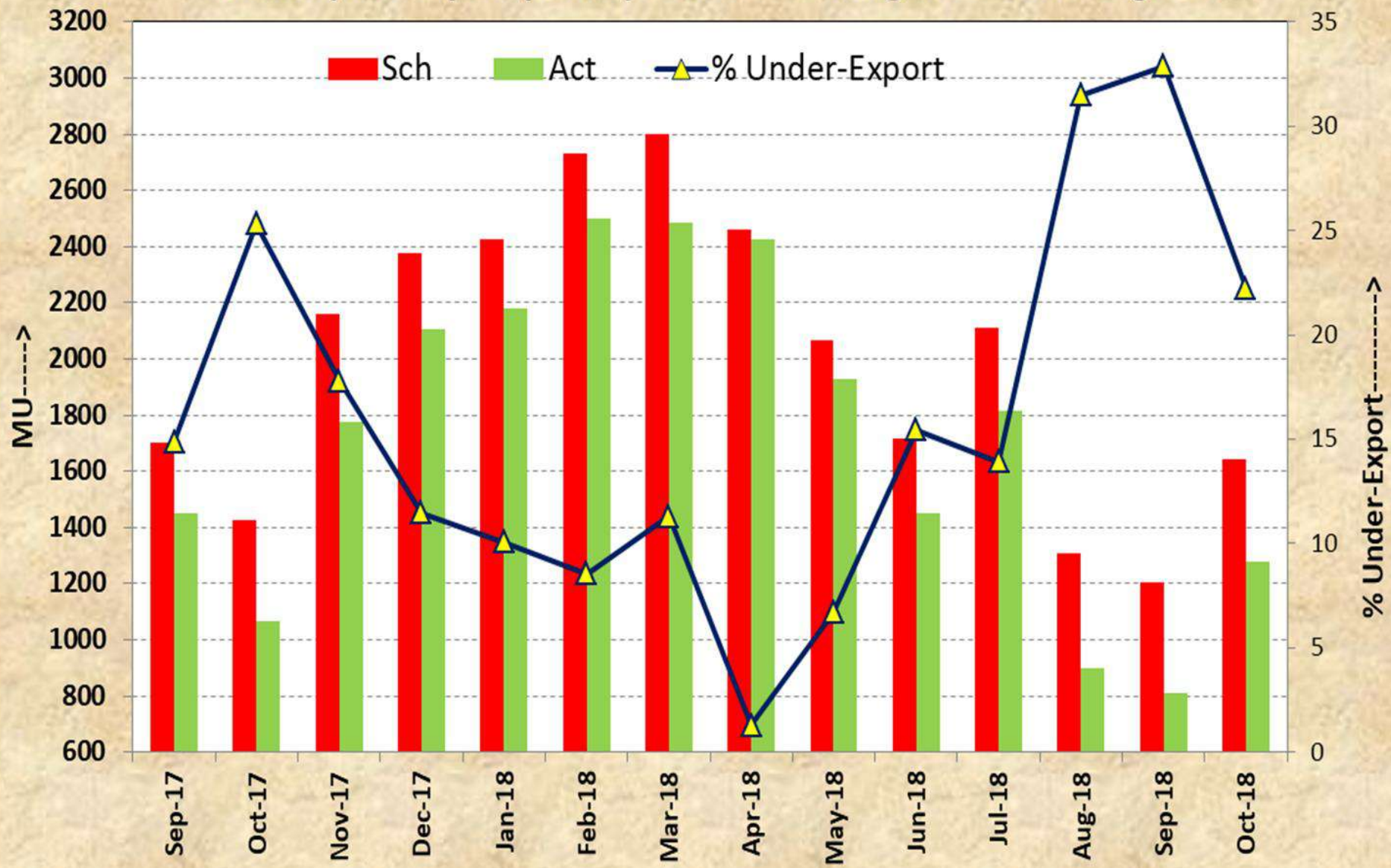
Net Energy (MU) Export to Bangladesh

■ 2016-17 ■ 2017-18 ■ 2018-19



Overdrawal of ER

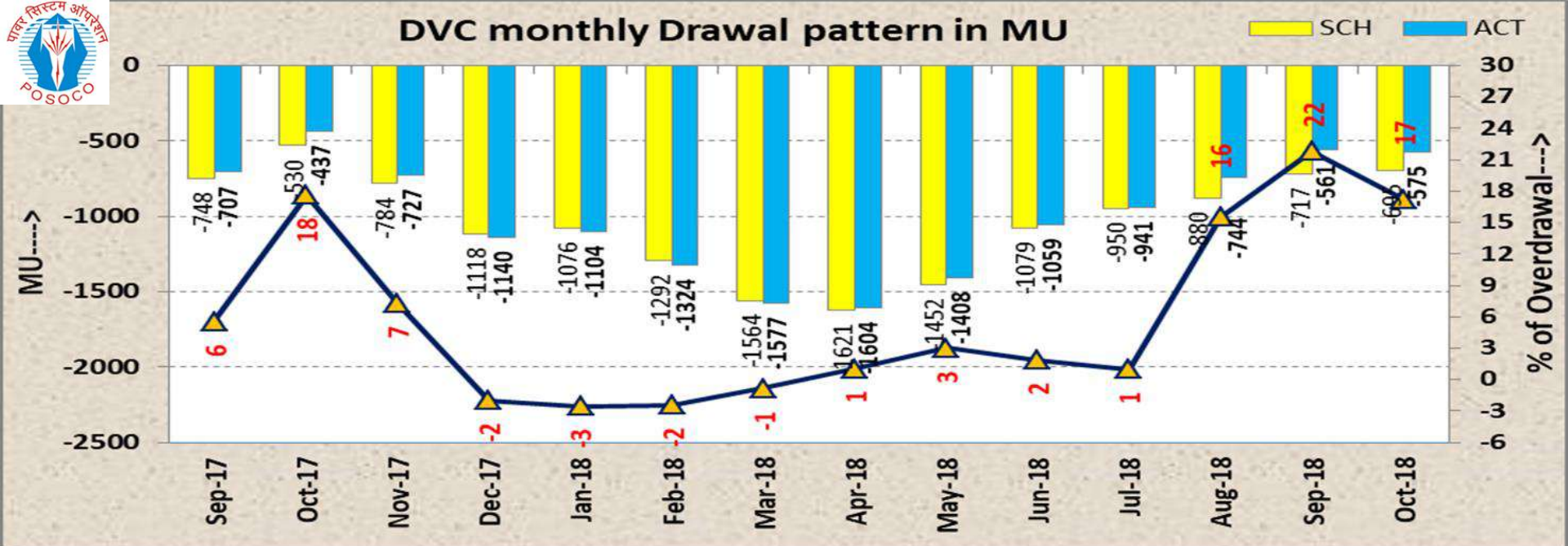
Monthly Net Export (In MU) from Eastern Region to Other Regions



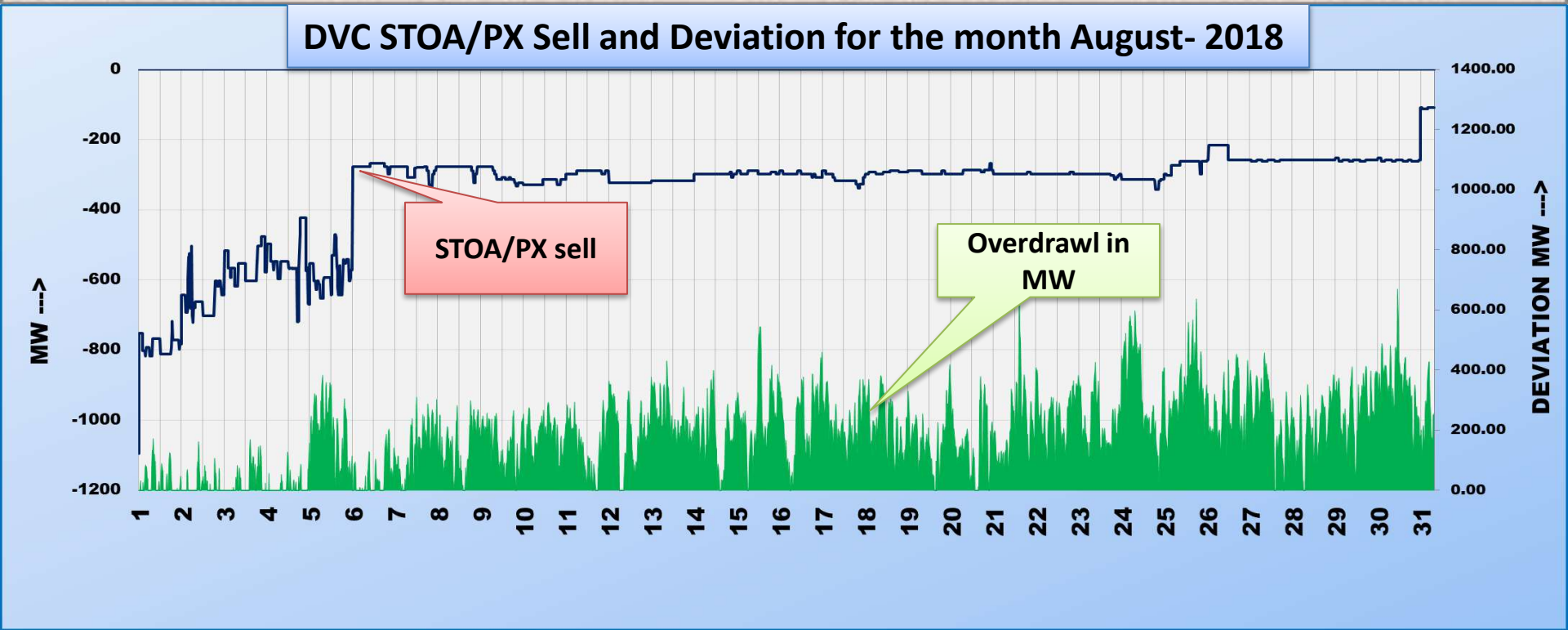
Eastern Region **Under-Export more than 12 %** continuously since June – 18 onward mainly due to over drawl of **DVC, Odisha and West Bengal ...max under export touched as high as 33%**

Overdrawal of DVC

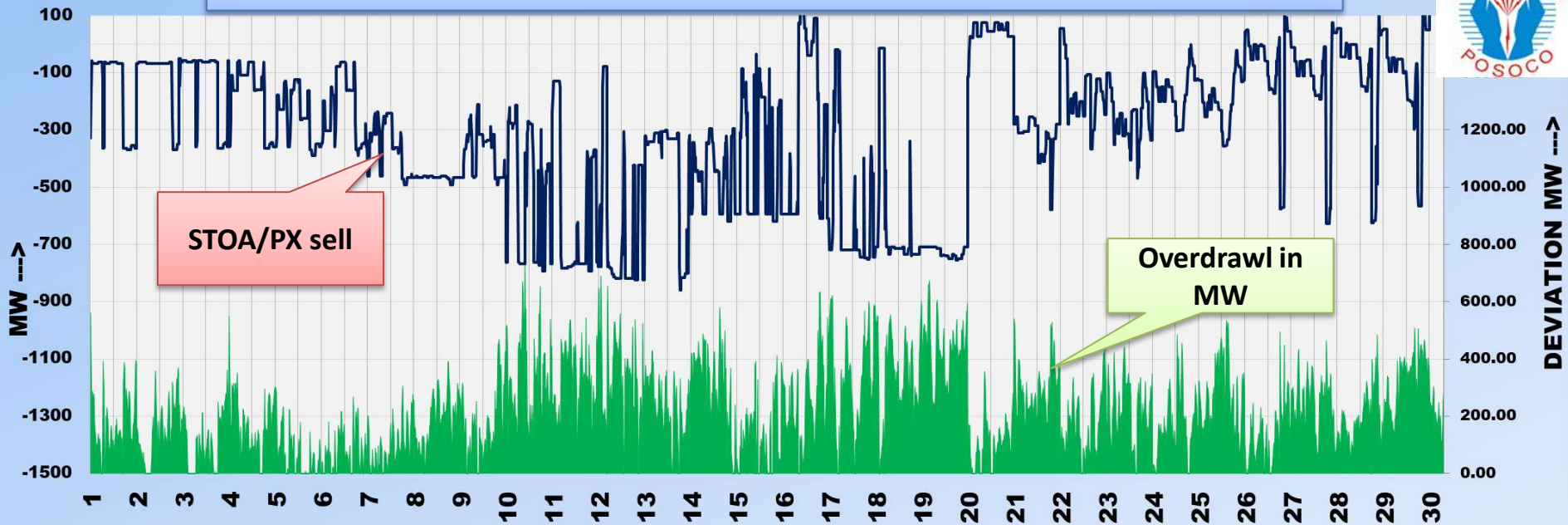
DVC monthly Drawal pattern in MU



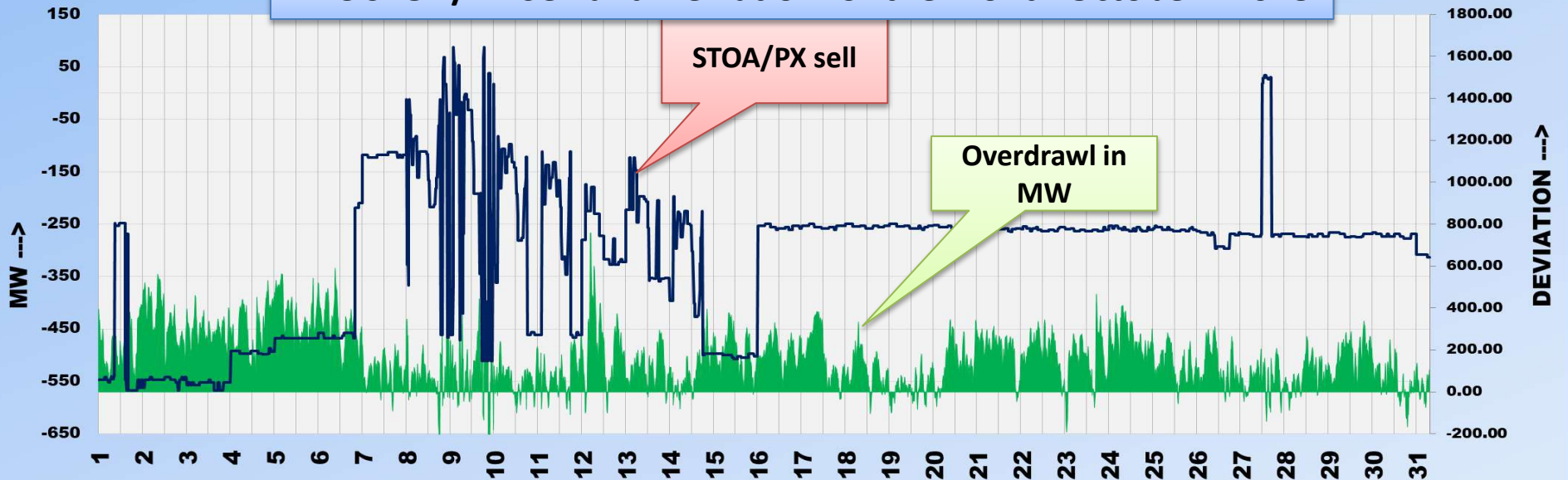
DVC STOA/PX Sell and Deviation for the month August- 2018



DVC STOA/PX Sell and Deviation for the month September - 2018



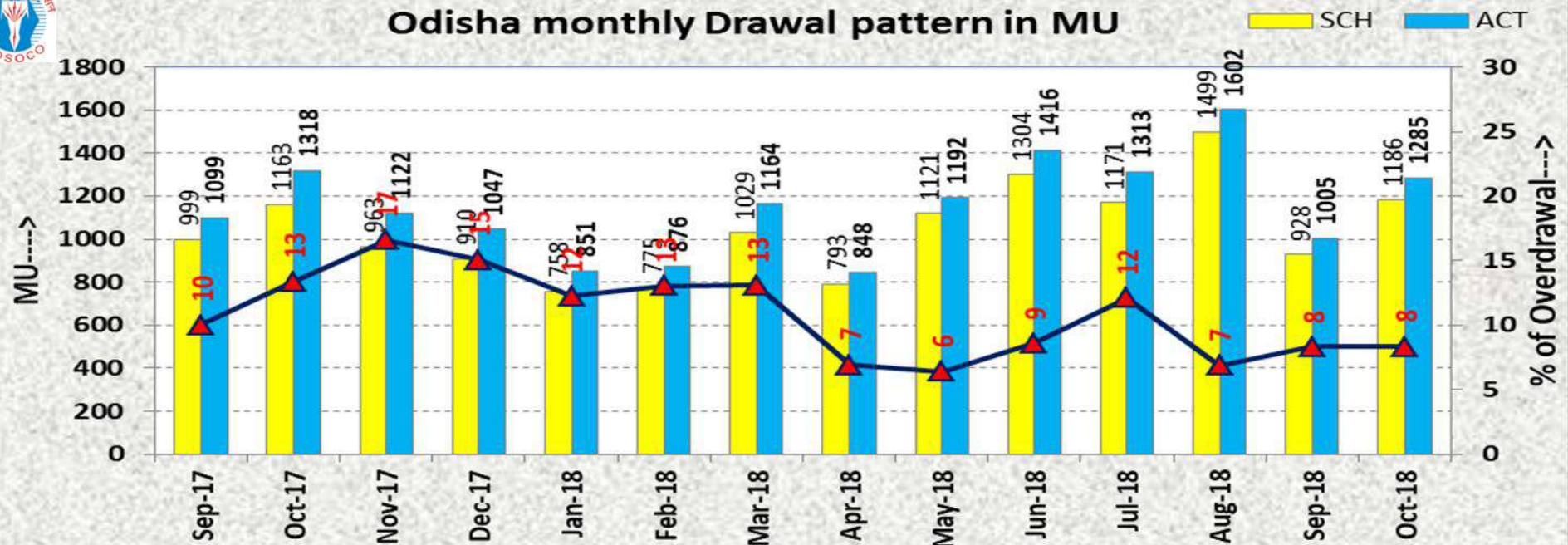
DVC STOA/PX Sell and Deviation for the month October - 2018



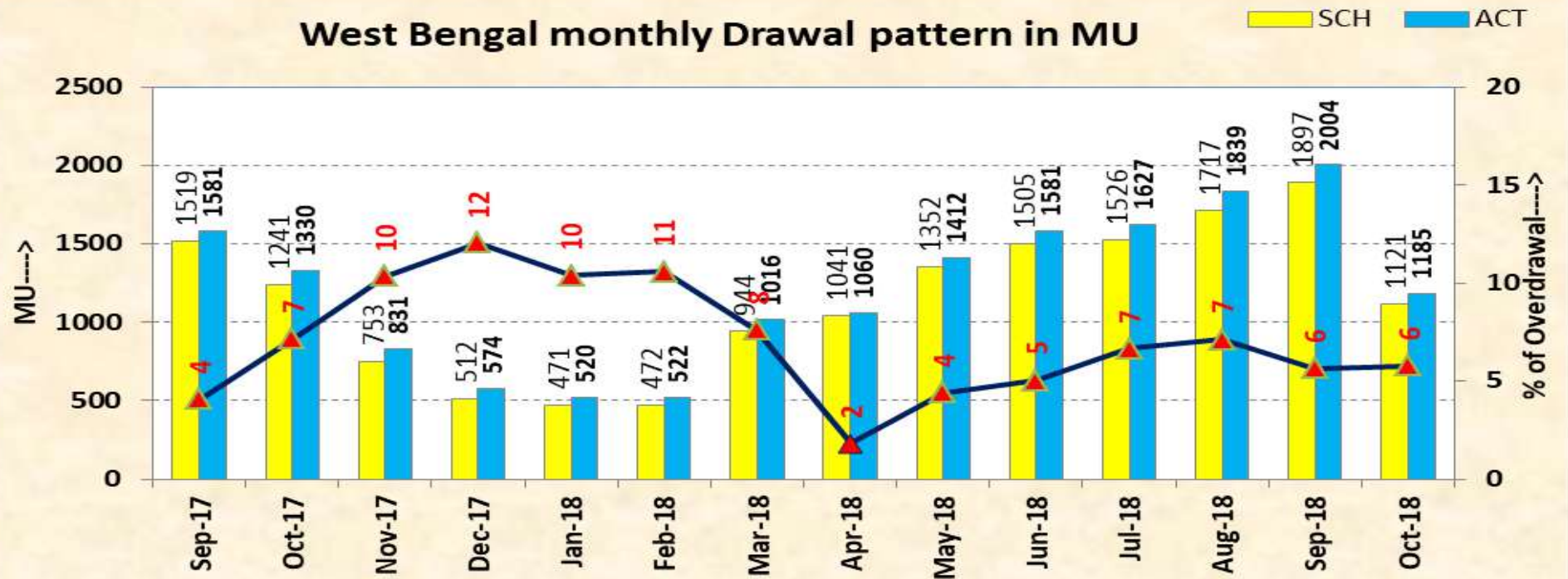
Overdrawal of Odisha & West Bengal



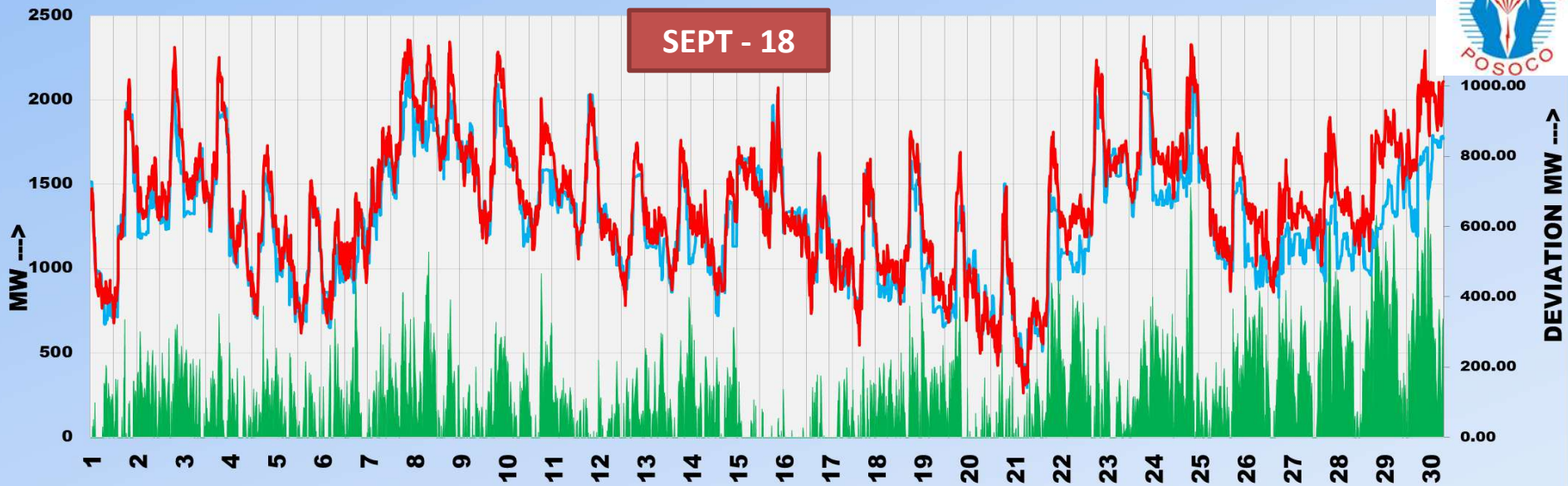
Odisha monthly Drawal pattern in MU



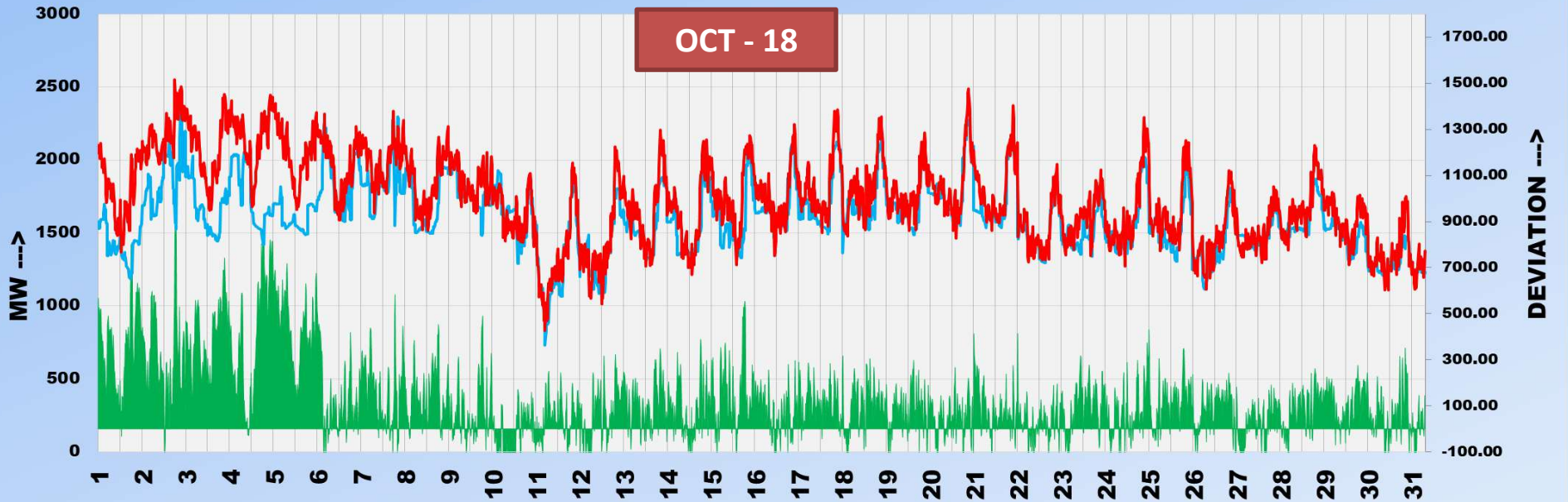
West Bengal monthly Drawal pattern in MU



Details of Odissa for date From 1st September 2018 to 29th September 2018



Details of Odissa for date From 1st October 2018 to 30th October 2018

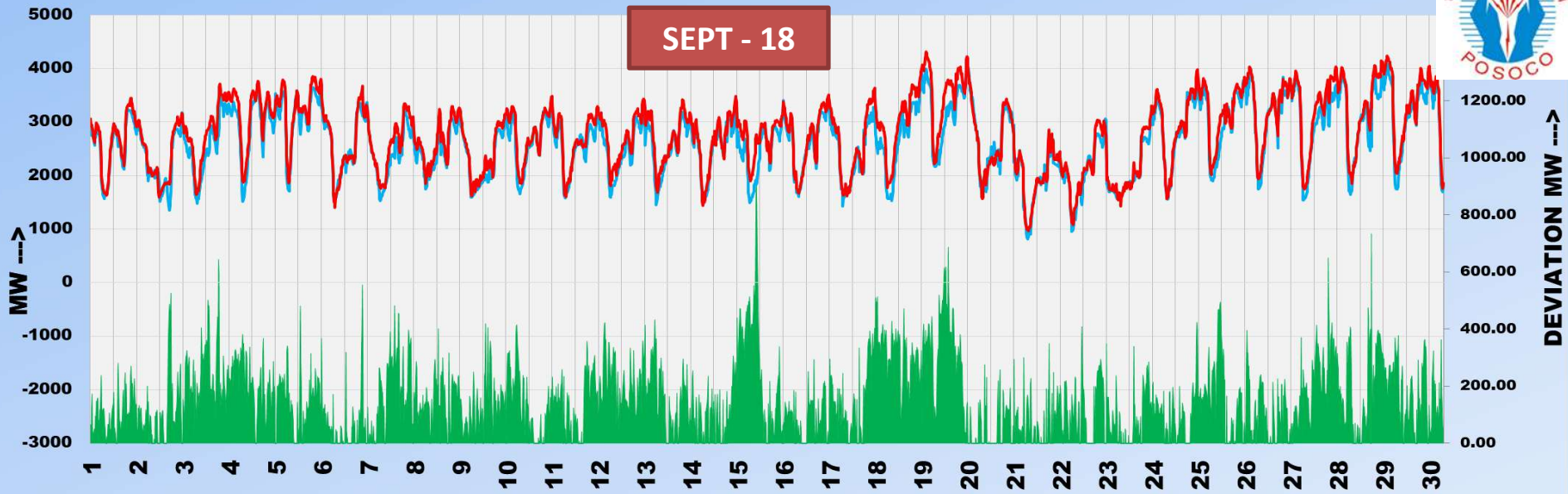


SCHEDULE DRAWL:-

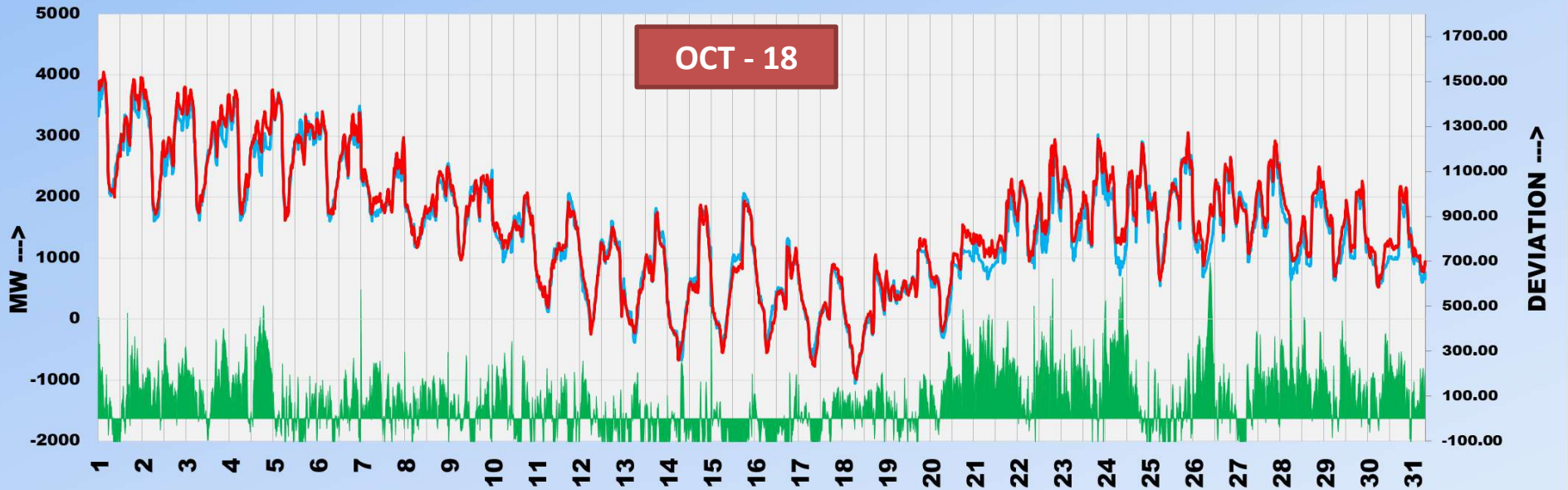
ACTUAL DRAWL:-

Deviation:-

Details of West Bengal for date From 1st September 2018 to 29th September 2018



Details of West Bengal for date From 1st October 2018 to 30th October 2018



SCHEDULE DRAWL:-

ACTUAL DRAWL:-

Deviation:-

Major Transmission Element addition & Outage status of tr. elements

Commissioning List of Transmission elements : July to October 2018

SL NO	Element Name	Owner	Charging Date	Charging Time
1	550MVAR (2 X± 150 MVAR VSC + 2 X 125 MVAR MSR) STATCOM at New Ranchi	PGCIL	15-07-2018	
2	400KV Sagardighi -Farakka-2 Line including LILO portion	PGCIL	28-07-2018	21:23
3	125 MVAR BR-4 at Durgapur	PGCIL	31-07-2018	17:14
4	400kV Jeerat-Sagardighi	PGCIL	05-08-2018	19:20
5	220kV Muzaffarpur-Dhalkebar-1	PGCIL	16-08-2018	22:17
6	220kV Muzaffarpur-Dhalkebar-2	PGCIL	16-08-2018	23:13
7	80 MVAR Line Reactor of 400kV New_Purnea-Frakka at Purnea end	PGCIL	26-10-2018	21:13
8	80 MVAR Line Reactor of 400kV New_Purnea-Gokarna at Purnea end	PGCIL	30-10-2018	12:53
9	125 MVAR Bus Reactor-II at Keonjhar	PGCIL	31-10-2018	17:17
10	240MVAR line reactor of 765kV Angul-Jharsuguda-III at Angul end	PGCIL	31-10-2018	20:59
11	765Kv Jharguda-Dharamjaigarh-III	PGCIL	31-10-2018	23:35
12	765Kv Jharguda-Dharamjaigarh-IV	PGCIL	01-11-2018	20:10

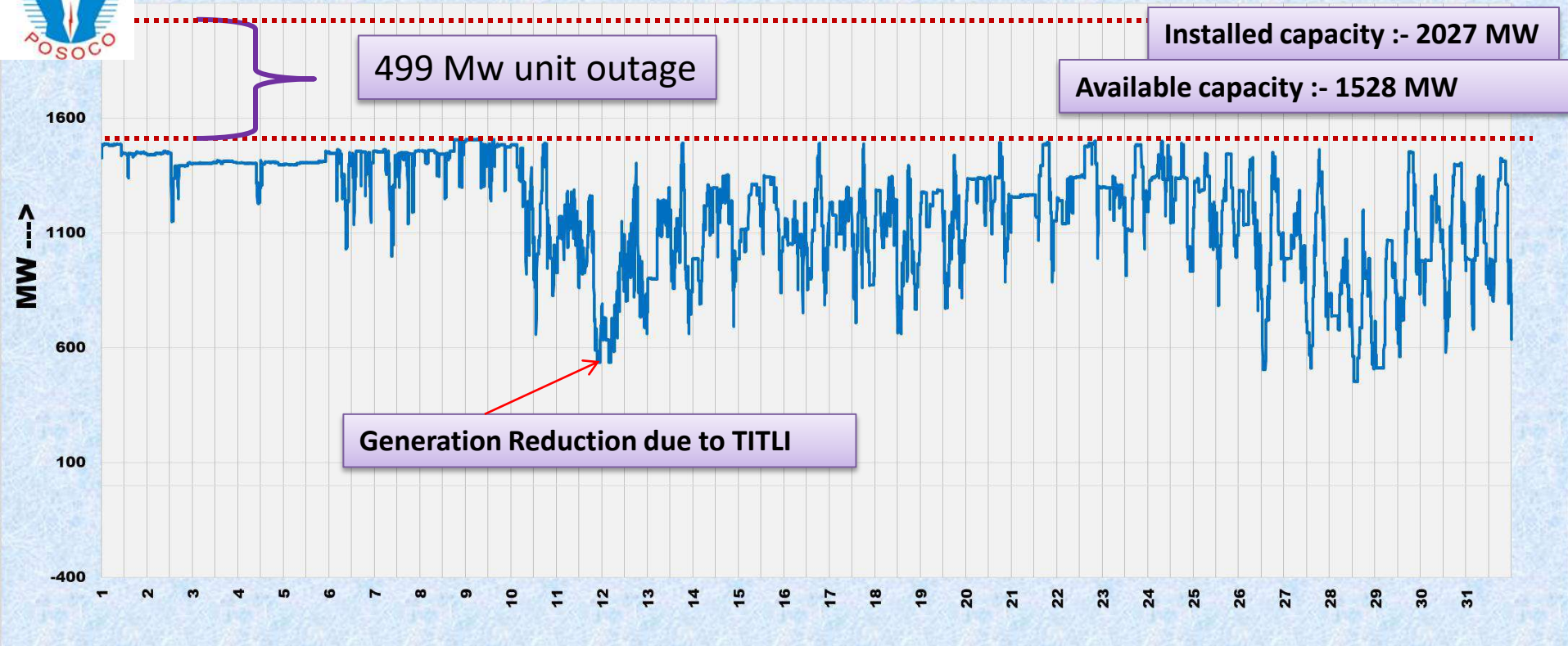
Major transmission element under Outage/Restored during July to Oct – 2018

- 400 KV Mpl – Maith – D/c out since 10th May – 2018 on tower collapse, restored on 11th July – 2018.
- 400kV Barh - Motihari D/C out since 28-06-2018 on tower collapse were restored on 04-10-2018.
- 400KV New Purnea- Biharsariff D/C out since 10-08-2018 on tower collapse.
- 400 KV Patna – Kisanganj D/C is out since 01-09-2018 on tower collapse.
- 400 KV Dikchu - Rangpo out since 06-07-2018.

Hydro Generation Pattern of Odisha



Odisha Hydro Generation for date From 1st October 2018 to 31st October 2018



	Long Outage	Forced Outage
Burla	75 : U-5(37.5 mw), U-6(37.5 mw)	90: U-1(49.5 mw), U-2(49.5 mw)
Chipilima	24 :U-3 (24mW)	
Balimela	180 : U-1(60 mw) U-2(60Mw) U-5 (60mW)	
Rengali	50: U1(50 Mw)	
Up Kolab	80 : U-2(80 Mw)	
	409	90



BALIMELA GEN(60*6+75*2=510 MW)

Hydro Power Generation (in MW)

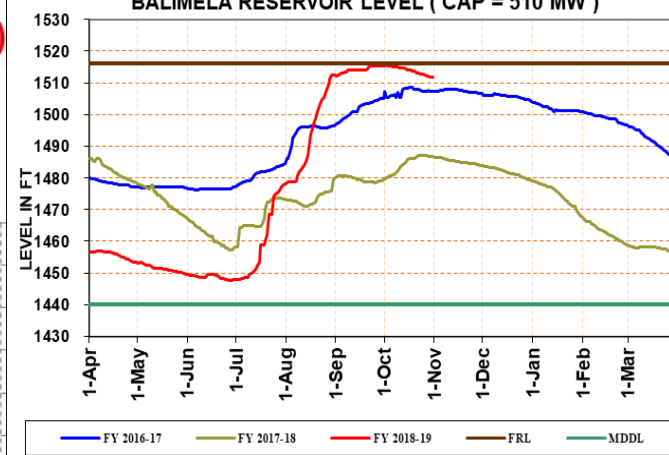
Days →

Duration (Percentage of Time)

♦ Generation (in MW)

Avl. Capacity = **375 Mw** U-1
out for R & M work since 05-
08-16 & U-7 Out for Stator
problem

BALIMELA RESERVOIR LEVEL (CAP = 510 MW)



Avl. Capacity = **330 Mw**, U-1,2 &5out
for R & M work,

Effective Installed capacity over the period was less due to **long outage of U-1(60 Mw), U-2(60 Mw) for R&M Work and U-5(60 Mw) on annual Maint**

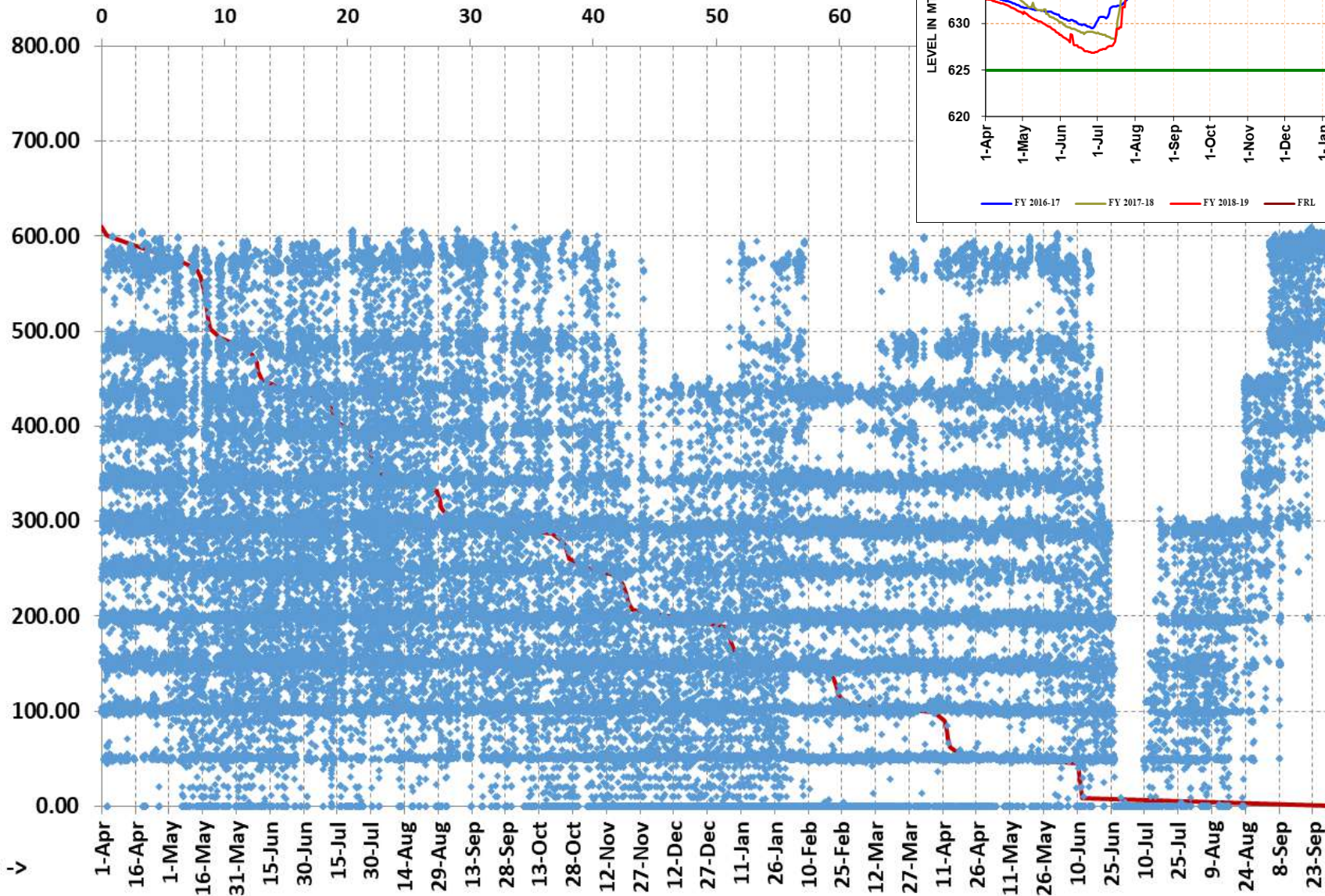


INDRAVATI GEN (150*4=600 MW)

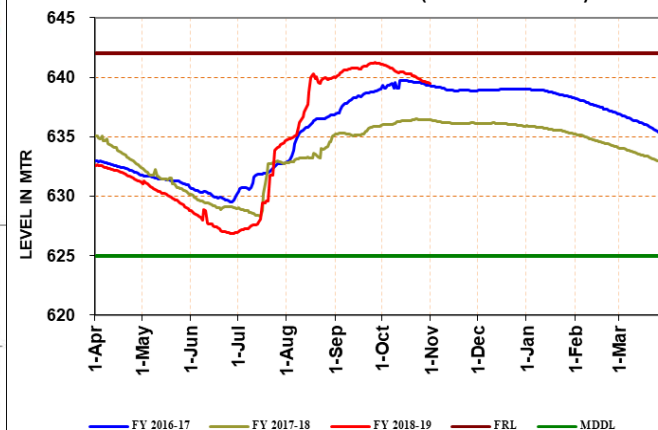
Hydro Power Generation (in MW)

Duration (Percentage of Time)

♦ Generation (in MW)

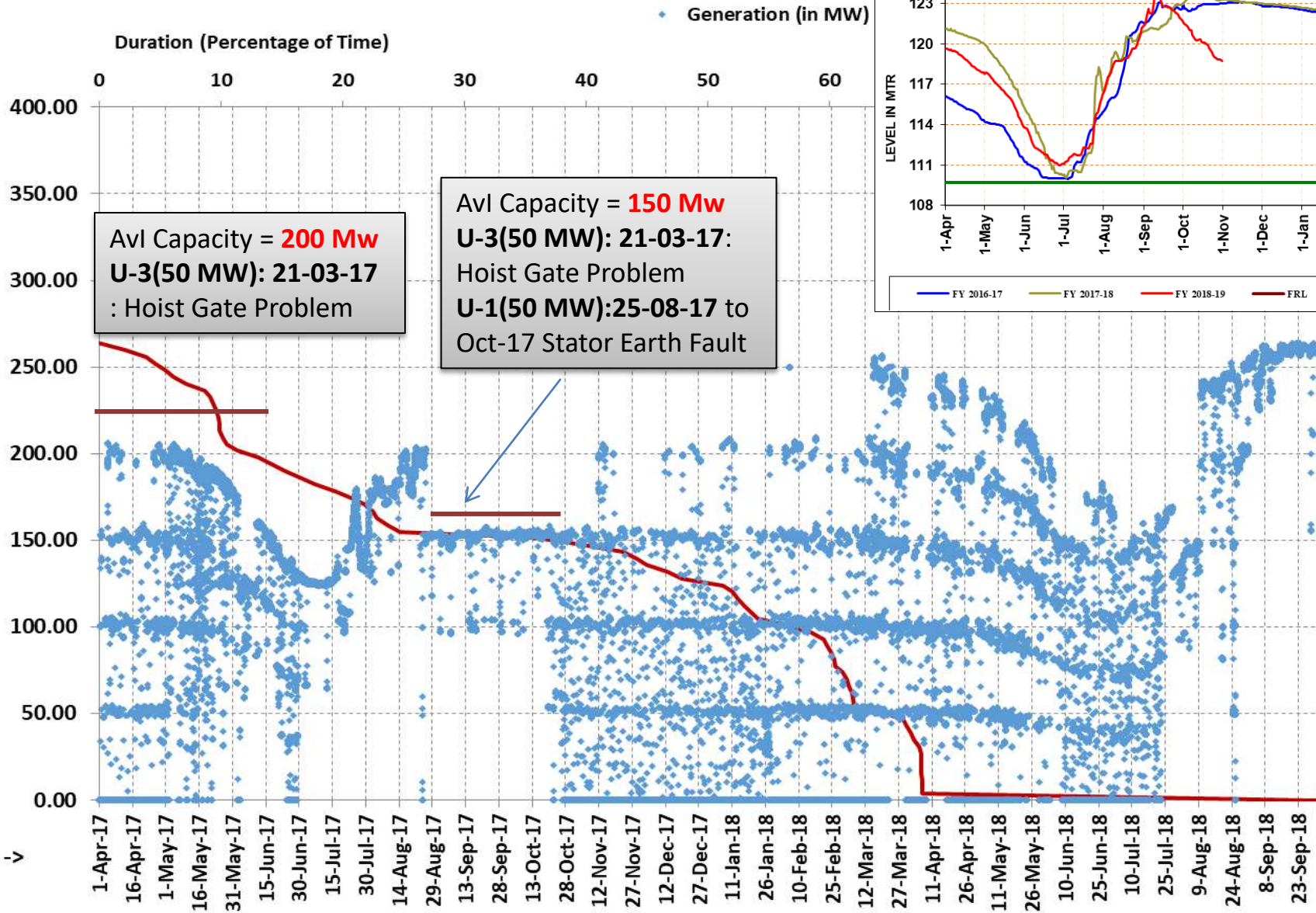


INDRAVATI RESERVOIR LEVEL (CAP = 600 MW)

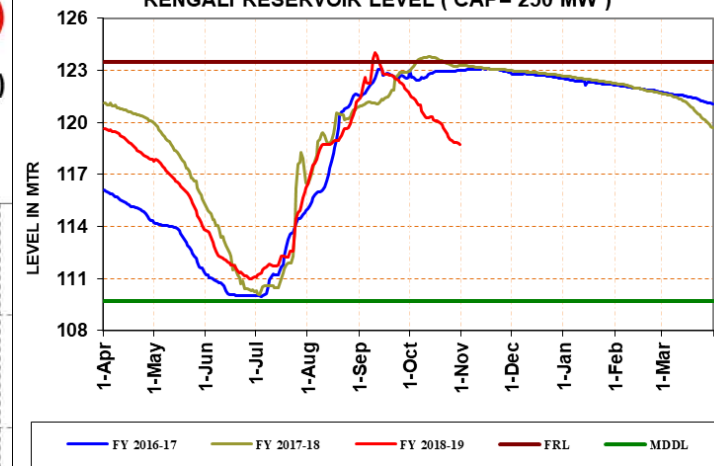


RENGALI(50*5=250 MW)

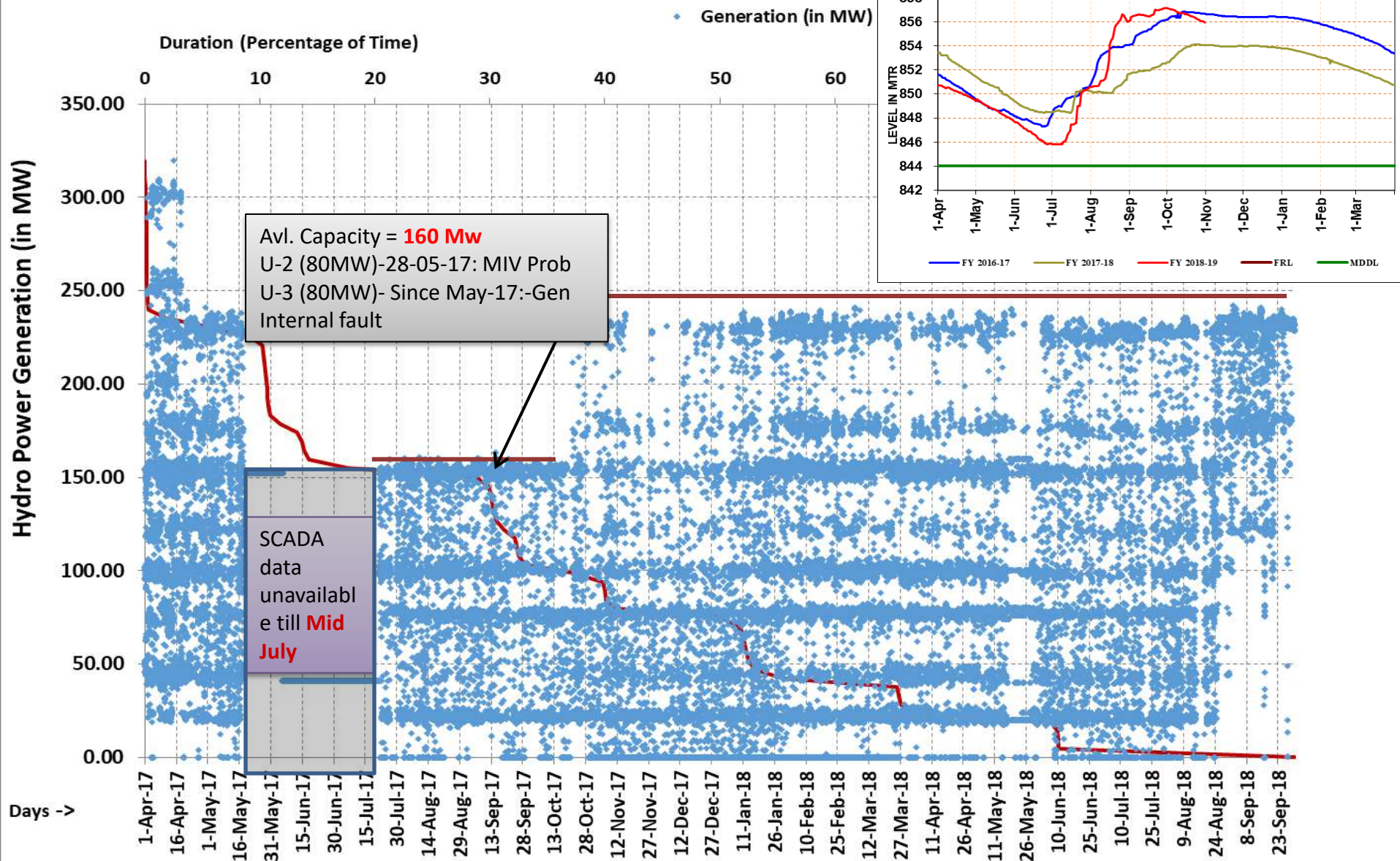
Hydro Power Generation (in MW)



RENGALI RESERVOIR LEVEL (CAP= 250 MW)

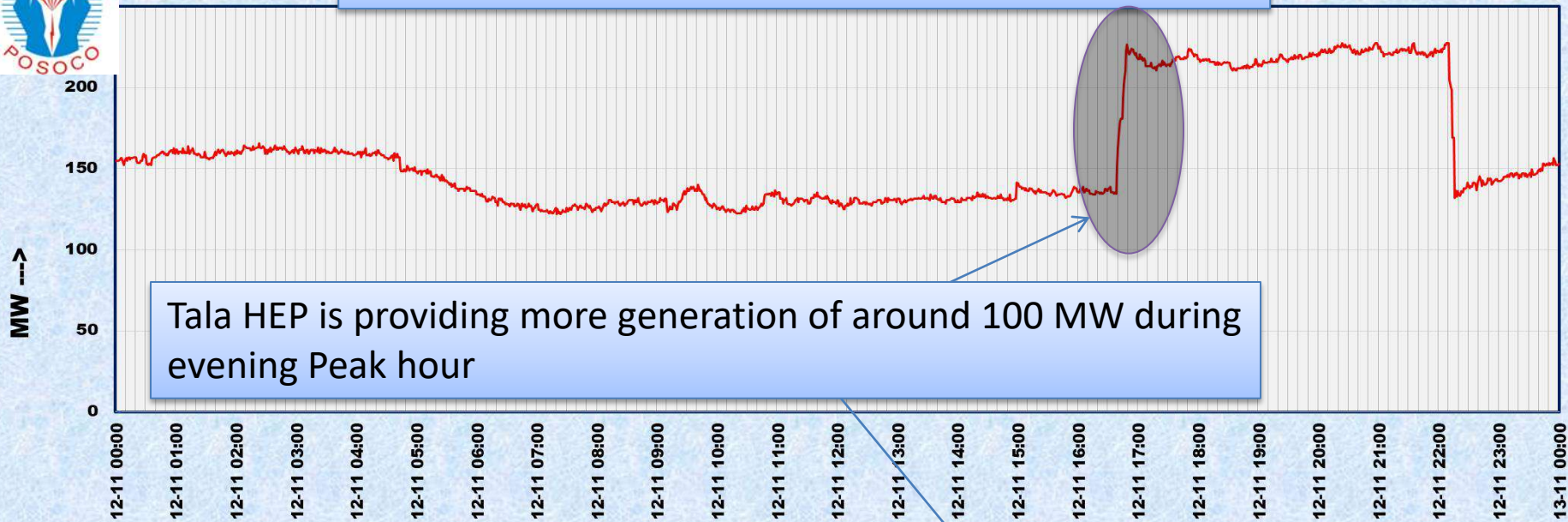


UPPER KOLAB (80*4=320 MW)

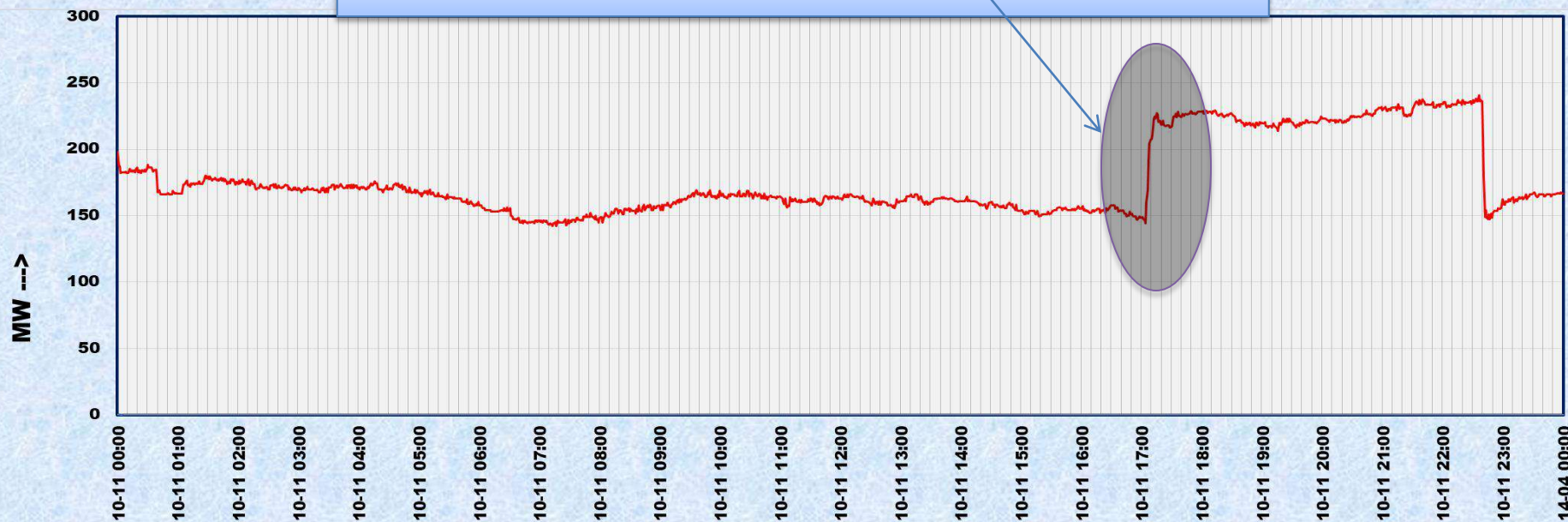


Available Installed capacity over the period was 240 MW, less due to **long outage of U-2 (80 Mw) for** repair of MIV and draft tube gate Leakage

Tala Generation for date 12th November 2018



Tala Generation for date 10th November 2018



Challenges and Issues

Challenges and Issues



- Evacuation Constraint of Teesta-III
 - Delay in construction of 400 kV Teesta-III-Rangpo –Kishanganj D/C resulted in very high loading of 400 kV Rangpo-Binaguri D/C (currently limited to 1700 MW) and evacuation constraint for Teesta-III leading to water spillage.
- Prolonged outage of 400 kV Purnea-Biharsaiff and Kishanganj-Patna D/C
 - Due to outage of these two important lines in same corridor the grid is stressed and all are required to adhere to grid discipline.
- High voltage and opening of lines
 - 400 kV Barh, Patna, Sasaram, Kishanganj, Jamsedpur, Subhasgram and Kolaghat experience high voltage during July-Oct 2018
 - During the last quarter (July-Sep) following lines were frequently opened to control voltage

S. No.	Name of Elements	Owner Name	Total No. of Outages	Total No. of Hours of Outage
1	400KV NEW CHANDITALA-KHARAGPUR-I	WBSETCL	3	31:26:00
2	400KV KHARAGPUR-KOLAGHAT-I	WBSETCL	2	65:52:00
3	400KV NEW PPSP-ARAMBAGH-I	WBSETCL	30	513:32:00
4	400KV NEW PPSP-ARAMBAGH-II	WBSETCL	27	994:45:00
5	400KV PPSP-BIDHANNAGAR-I	WBSETCL	3	74:07:00

- Instead of opening of lines voltage should be arrested by planning proper reactive compensation
- ICTs installed at Patna, Gaya and Maithon experiences very high loading during July-Oct

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