

Eastern Regional Power Committee, Kolkata

Minutes of Special Meeting on Preparation of Phasing out Plan in respect of non compliant thermal units of Eastern Region for implementation of new Environmental Norms, issued by MOEF&CC held on 24.03.2017 at 11:30 Hrs. at ERPC, Kolkata.

List of participants in the meeting is enclosed in **Annexure – I**.

Member Secretary, ERPC welcomed all the participants and thanked all the members for attending the meeting on short notice. He informed that New Environmental Norms issued by MoEF&CC are required to be implemented. Presently, in India there is about 72 GW capacity of thermal units, which are not in a position to install FGDs due to non-availability of space. Only for Eastern Region this figure is 15143 MW (73 nos. units). As these units would not be able to meet new SOx emission norms are required to be phased out.

In the meeting held on 14th March 2017, between Secretary (P) and Secretary (MoEF&CC), it was decided that CEA would prepare the plan for phasing out the aforesaid. Subsequently, a meeting was held at CEA for discussion on this issue on 17.03.2017 and it was decided that RPC secretariat would call an urgent meeting with constituents on this issue and prepare a phasing out plan in consultation with all utilities including RLDCs. The phasing out plan should consider grid operation issues like grid security, transmission constraints and local problems like radial loads. The focus of the whole exercise should be technical like maintaining load generation balance and grid security aspects, as commercial aspect would be looked after by appropriate commission.

GM, ERLDC gave a detailed presentation on Phasing out of non-compliant thermal units (the presentation is enclosed at **Annexure-II**). He highlighted the effect of phasing out of thermal units in ER, the power supply position of ER (State-wise), shortfall (state-wise) of availability from own source as well as from central sector, grid security aspects etc. It was informed that out of 15143 MW the in service capacity of 13878 MW will be phased out in ER; the rest are either not in service or decommissioned by the respective utilities. He suggested that the phasing out may be done in keeping the factors under the consideration like criterion of Grid security, Load Centre, Connectivity voltage level, Generation level etc.

JUSNL informed that Patratu TPS units are already out of operation and can be phased out.

As no TVNL representative was present, **JUSNL** representative was advised to coordinate with TVNL and submit the plan of TVNL units.

DVC informed that Durgapur TPS Unit # 3 and CTPS unit # 1 has been de-commissioned w.e.f. 10.03.2016 & 13.01.2017 respectively.

DTPS U#4 and BTPS-B U# 1 & 2 are at load centres and could not be phased out as it may create constraints and endanger grid security. Also confirmed that Sox is within the permissible limit for Bokaro-B units.

CTPS U#2 & 3 may be phased out in planned manner by June, 2018 after the commissioning of 132 kV Dhanbad-Patherdih line.

Regarding Mejia U # 1,2,3,4 & 5 there is no space for FGD installation; however the SOx and NOx levels are maintained within the limit.

GRIDCO informed that TTPS old units had been renovated in 2000 with the cost of Rs. 800 Cr. and in consultation with CEA. The life of TTPS units has been enhanced upto 2020-21. Presently the plant is one of the highest PLF plant in India. Further, these units are within the load centre of Odisha.

WBPDC informed that Bandel TPS and Kolaghat TPS are within the load centres of West Bengal. Further it was added that major R&M of Bandel U#5 has been carried out recently. So, the date of commissioning may be considered from the date of completion of R&M. Also one unit operation of the Bandel plant is not possible. Gradually 3 nos. smaller units may be decommissioned and the same space can be utilized for installation of FGD for 2 units. Also they mentioned that R&M project for the smaller units are in advance stage and also they plan to run the units in shift operation.

Regarding Kolaghta TPS, FGD space is available for U# 1, 2 & 3 and study will be carried out for availability of space for FGD of U# 4, 5 & 6.

Santaldih U# 1, 2, 3 \$ are already decommissioned.

For Sagardighi U# 1 & 2 and Santaldih U 5 & 6 space for FGD installation is available.

For Bakreswar units space availability has to be checked.

Member Secretary advised WBPDC to submit its complete plan for FGD installation along with the space availability documents.

CESC informed that Southern U# 1 & 2 are occasionally being used at present and Titagarh U#1, 2, 3 & 4 are presently not in operation. They will phase out both the plants gradually.

DPL informed that their U#6 will come on bar by 14.04.17. Members advised to phase out this unit as it was not in operation since more than last 4 years.

Regarding DPL U#7 & U#8, there is space available for installation of FGD.

NTPC informed that for FSTPS U 1,2,3,4 & 5 and KhSTPS U# 1,2, 3 & 4 units have no space for FGD installation and these units will be kept for shift operation for matching generation with the solar.

Regarding KhSTPS U# 5 & 6 space is available for FGD installation and it will be installed in 2023-24.

NTPC representative assure to communicate shortly their plan regarding BRBCL, Nabinagar unit.

As there was no representation from Bihar, decision on Barauni U# 6 & 7 which are not generating since long (2012 & 2006 respectively) and KBUNL U# 1 & 2, no decision could be taken up.

There was no representation from IBUEL, so the same could not be discussed.

After detail deliberation, it was decided that all generating utilities will submit their phasing out plan for thermal units where FGD installation is not possible by 29.03.2017 directly to CEA with a copy to ERPC positively.

Further, it was also decided that the utilities, which are facing difficulties in closing these units by December 2017, should clearly mentioned the reason with proper explanation from their respective STU/SLDC to enable CEA to took up the issue with MoP and MoEF.

Before concluding the meeting Member Secretary once again request all participants to furnish their detail plan along with proper justification to the Chief Engineer, GM Division in his email: **cegmcea1@gmail.com** positively by 29.03.2017 (Wednesday) with a copy to ERPC secretariat.

Meeting ended with vote of thanks to the chair.

Participants in Sp. meeting on Phasing out of Thermal units as per the new norms of MOEF&CC

Venue: ERPC Conference Hall, Kolkata

Time: 11:30 hrs

Date: 24.03.2017 (friday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
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4	Manas Kumar Das	Director (Comm) GRIDCO	7606000327	director.com@pohov.com manaskudasa@pohov.co	Manas Kumar Das
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20	D. K. Bauri	EE, ERPC	9883617236	eeop.erpc@gov.in	D. K. Bauri

Participants in Sp. meeting on Phasing out of Thermal units as per the new norms of MOEF&CC

Venue: ERPC Conference Hall, Kolkata

Time: 11:30 hrs

Date: 24.03.2017 (friday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
21	Shailesh Bakshi	ESE, SLDC JUSNL, Raveli	9470145226	sldcranchi@gmail.com	
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Phasing out of power plant for Implementation of New Environmental Norms (No space for installation of FGD)

ERLDC, POSOCO, KOLKATA

24th March'2017

NEW ENVIRONMENTAL NORMS FOR THERMAL POWER STATIONS IN INDIA



- **In continuing efforts to safeguard the environment and reduce emissions from power sector, India has made the following commitments in COP 21:**
 - India intends to reduce the emissions intensity of its GDP by 33 to 35 % by 2030 from 2005 level.
 - To achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030 with the help of transfer of technology and low cost international finance.
 - Introducing new, more efficient and cleaner technologies in thermal power generation.
- **To reduce emissions from Thermal Power Stations,** Ministry of Environment, Forest and Climate Change has also issued new environmental norms in December 2015 regarding **Suspended Particulate matter (SPM), SO_x, NO_x, Mercury.** **Norms for specific water consumption** by Thermal Power Stations have also been notified to conserve water.

EXISTING EMISSION NORMS FOR TPS

Emission parameter	Limiting Values
Suspended Particulate Matter (SPM)	<p>Less than 210 MW (1989) : 350 mg/Nm³ 210 MW or more(1989) : 150 mg/Nm³</p> <p>The above limits were further reduced to 100 mg/Nm³ in 2003 under Corporate Social Responsibilities.</p> <p>Limit of 50 mg/Nm³ is being specified on case to case basis depending on the area</p>
NOx	None for coal based stations
SOx	<p>None, stack provided for dispersion <500 MW - 220 m . >=500 MW - 275 m FGD space provision for units size 500 MW and above.</p>

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NEW EMISSION NORMS NOTIFIED ON 07.12.2015

Emission parameter	TPPs (units) installed before 31 st December, 2003	TPPs (units) installed after 31 st December 2003 and upto 31 st December 2016	TPPs (units) to be installed from 1 st January 2017
Particulate Matter	100 mg/Nm ³	50 mg/Nm ³	30 mg/Nm ³
Sulphur Dioxide (SO ₂)	<p>600 mg/Nm³ for units less than 500MW capacity</p> <p>200 mg/Nm³ for units 500MW and above capacity</p>	<p>600 mg/Nm³ for units less than 500MW Capacity</p> <p>200 mg/Nm³ for units 500MW and above capacity</p>	100 mg/Nm ³
Oxides of Nitrogen (NOx)	600 mg/Nm ³	300 mg/Nm ³	100 mg/Nm ³

To be complied within 2 years by existing stations and w.e.f 01.01.2017 for plants under construction

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Background

- **Subsequently, a meeting was held at CEA for discussion on this subject on 17.3.2017 and following were decided**
 - In the meeting it was decided that a meeting should be held within a week so that plan is forwarded to CEA by week end.
 - Chairperson, CEA also advised that **POSOCO may prepare a report considering an extreme case scenario in respect of 2018-19 if 72 GW capacity is taken out in Dec,2017.**In case of load generation balance data for 2018-19 is not available, any present day scenario can be used as representative case.
 - The phasing out plan **should consider grid operation issues like grid security, transmission constraints and local problems like radial loads** .The focus of the whole exercise should be technical like maintaining load generation balance and grid security aspects, as **commercial aspect would be looked after by appropriate commission.**

Power plants to be phased out by Dec 2017, which don't have space for installation of FGD

List of power plants to be phased out which don't have space for installation of FGD

Bihar

Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
1	BSPGCL	Barauni TPS	3	105 MW	5-1-1983	33	Not in operation
2	BSPGCL	Barauni TPS	4	105 MW	3-31-1985	31	Not in operation
3	NTPC & Bihar JV	Muzaffarpur TPS	1	110 MW	3-31-1985	31	In frequent operation
4	NTPC & Bihar JV	Muzaffarpur TPS	2	110 MW	3-17-1986	31	In frequent operation

Total :- 430 MW

List of power plants to be phased out which don't have space for installation of FGD

Jharkhand

Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
1	TUVNL	TENUGHAT TPS	1	210	14-04-1994	23	In operation
2	TUVNL	TENUGHAT TPS	2	210	10-10-1996	20	Long outage due to problem in turbine

Total :- 420 MW

List of power plants to be phased out which don't have space for installation of FGD



DVC

Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
1	D.V.C	BOKARO `B` TPS	1	210	24-03-1986	31	In operation
2	D.V.C	BOKARO `B` TPS	2	210	01-11-1990	26	In operation
3	D.V.C	BOKARO `B` TPS	3	210	01-08-1993	24	In operation
4	D.V.C	MEJIA TPS	1	210	01-03-1996	21	In operation
5	D.V.C	MEJIA TPS	2	210	24-03-1997	20	In operation
6	D.V.C	MEJIA TPS	3	210	25-03-1998	19	In operation
7	D.V.C	MEJIA TPS	4	210	12-10-2004	12	In operation
8	D.V.C	MEJIA TPS	6	250	31-03-2007	10	In operation
9	D.V.C	MEJIA TPS	5	250	01-10-2007	9	In operation
10	D.V.C	CHANDRAPURA	7	250	04-11-2009	7	In operation
11	D.V.C	CHANDRAPURA	8	250	31-03-2010	7	In operation

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Total :- 2470 MW

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List of power plants to be phased out which don't have space for installation of FGD



Odisha

Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
1	NTPC	Talcher TPS Old	1	60 MW	12-17-1967	48.32	In operation
2	NTPC	Talcher TPS Old	2	60 MW	3-28-1968	48.04	In operation
3	NTPC	Talcher TPS Old	3	60 MW	7-11-1968	47.75	In operation
4	NTPC	Talcher TPS Old	4	60 MW	4-11-1969	47.35	In operation
5	NTPC	Talcher TPS Old	5	110 MW	3-24-1982	34.04	In operation
6	NTPC	Talcher TPS Old	6	110 MW	3-24-1983	33.04	In operation

Total :- 460 MW

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List of power plants to be phased out which don't have space for installation of FGD



West Bengal

Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
1	C.E.S.C. Pvt.	TITAGARH TPS	2	60	12-12-1982	34	In Operation
2	C.E.S.C. Pvt.	TITAGARH TPS	3	60	26-04-1983	34	In Operation
3	C.E.S.C. Pvt.	TITAGARH TPS	4	60	16-01-1984	33	In Operation
4	C.E.S.C. Pvt.	TITAGARH TPS	1	60	17-03-1985	32	In Operation
5	C.E.S.C. Pvt.	SOUTHERN TPS	2	68	12-08-1990	27	Not in operation
6	C.E.S.C. Pvt.	SOUTHERN TPS	1	68	10-04-1991	26	Not in operation
7	D.P.L.	D.P.L. TPS	6	110	03-07-1985	32	Under R & M
8	D.P.L.	D.P.L. TPS	7	300	24-11-2007	9	In Operation
9	D.P.L.	D.P.L. TPS EXT.	8	250	31-03-2014	3	In Operation

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List of power plants to be phased out which don't have space for installation of FGD

West Bengal (Cont....)



Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
10	WBPDCL	Bandel TPS	1	60	9-1-1965	50.61	In Operation
11	WBPDCL	Bandel TPS	2	60	10-1-1965	50.53	In Operation
12	WBPDCL	Bandel TPS	3	60	2-1-1966	50.19	In Operation
13	WBPDCL	Bandel TPS	4	60	8-1-1966	49.70	In Operation
14	WBPDCL	Bandel TPS	5	210	10-8-1982	33.50	In Operation
15	WBPDCL	Kolaghat TPS	1	210	8-13-1990	25.65	In Operation
16	WBPDCL	Kolaghat TPS	2	210	12-16-1985	30.31	In Operation
17	WBPDCL	Kolaghat TPS	3	210	7-24-1984	31.70	In Operation
18	WBPDCL	Kolaghat TPS	4	210	24-01-1984	33.16	In Operation
19	WBPDCL	Kolaghat TPS	5	210	28-12-1993	23.23	In Operation
20	WBPDCL	Kolaghat TPS	6	210	17-03-1991	26.01	In Operation

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List of power plants to be phased out which don't have space for installation of FGD



West Bengal (Cont....)

Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
21	WBPDC	BAKRESWAR TPS	1	210	07-06-2009	7.78	In operation
22	WBPDC	BAKRESWAR TPS	2	210	17-07-1999	17.67	In operation
23	WBPDC	BAKRESWAR TPS	3	210	20-05-2000	16.83	In operation
24	WBPDC	BAKRESWAR TPS	4	210	21-03-2001	15.99	In operation
25	WBPDC	BAKRESWAR TPS	5	210	24-12-2007	9.23	In operation
26	WBPDC	SAGARDIGHI TPS	1	300	20-07-2008	8.66	In operation
27	WBPDC	SAGARDIGHI TPS	2	300	21-12-2007	9.24	In operation
28	WBPDC	SANTALDIH TPS	5	250	07-11-2007	9.36	In operation
29	WBPDC	SANTALDIH TPS	6	250	29-06-2011	5.72	In operation

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Total :- 4896 MW¹³

List of power plants to be phased out which don't have space for installation of FGD



Central Sector

Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
1	NTPC	FARAKKA STPS	1	200	01-01-1986	31.22	In operation
2	NTPC	FARAKKA STPS	2	200	24-12-1986	30.24	In operation
3	NTPC	FARAKKA STPS	3	200	06-08-1987	29.63	In operation
4	NTPC	FARAKKA STPS	4	500	25-09-1992	24.48	In operation
5	NTPC	FARAKKA STPS	5	500	16-02-1994	23.09	In operation
6	NTPC	KAHALGAON TPS	1	210	31-03-1992	24.97	In operation
7	NTPC	KAHALGAON TPS	2	210	17-03-1994	23.01	In operation
8	NTPC	KAHALGAON TPS	3	210	24-03-1995	21.99	In operation

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List of power plants to be phased out which don't have space for installation of FGD Central Sector (Cont..)



Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
9	NTPC	KAHALGAON TPS	4	210	18-03-1996	21.01	In operation
10	NTPC	KAHALGAON TPS	5	500	31-03-2007	9.964	In operation
11	NTPC	KAHALGAON TPS	6	500	16-03-2008	9.003	In operation
12	NTPC	TALCHER STPS	1	500	19-02-1995	22.08	In operation
13	NTPC	TALCHER STPS	2	500	27-03-1996	20.98	In operation
14	NTPC	TALCHER STPS	5	500	13-05-2004	12.85	In operation
15	NTPC	TALCHER STPS	6	500	06-02-2005	12.11	In operation
16	NTPC & Railway JV	NABI NAGAR TPP	1	250	20-03-2016	1.00	Not generating

Total :- 5690 MW

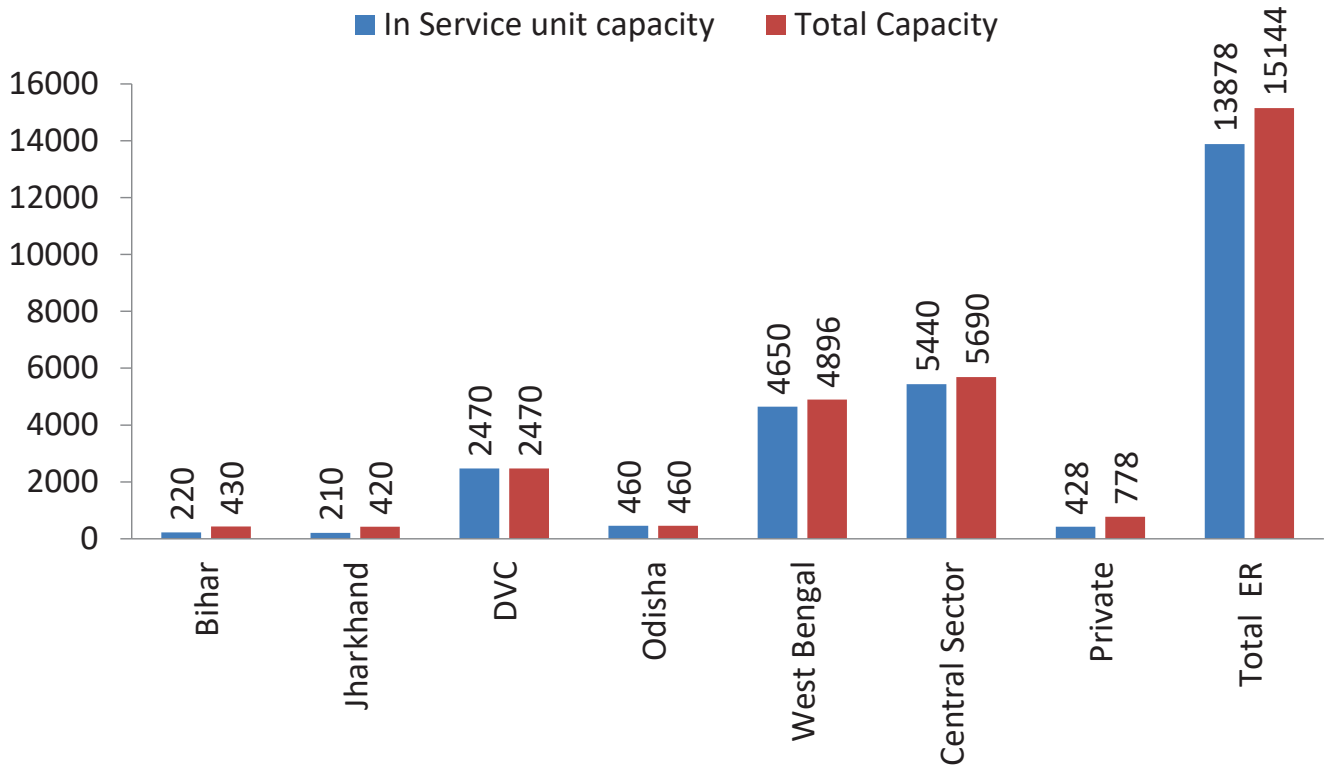
List of power plants to be phased out which don't have space for installation of FGD Private



Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)	Date of Commissioning (mm/dd/yyyy)	Age as on 31.03.16 (yrs)	Present Status
1	Ind barath	IND BARATH TPP	1	350	25-02-2016	1.052	Not generating
2	TATA Power Co.	JOJOBERA TPS	1	67.5	12-09-1997	19.52	In operation
3	TATA Power Co.	JOJOBERA TPS	2	120	01-02-2001	16.13	In operation
4	TATA Power Co.	JOJOBERA TPS	3	120	01-02-2002	15.13	In operation
5	TATA Power Co.	JOJOBERA TPS	4	120	23-11-2005	11.32	In operation

Total :- 777.5 MW

Summary of power plants capacity (in MW) to be phased out

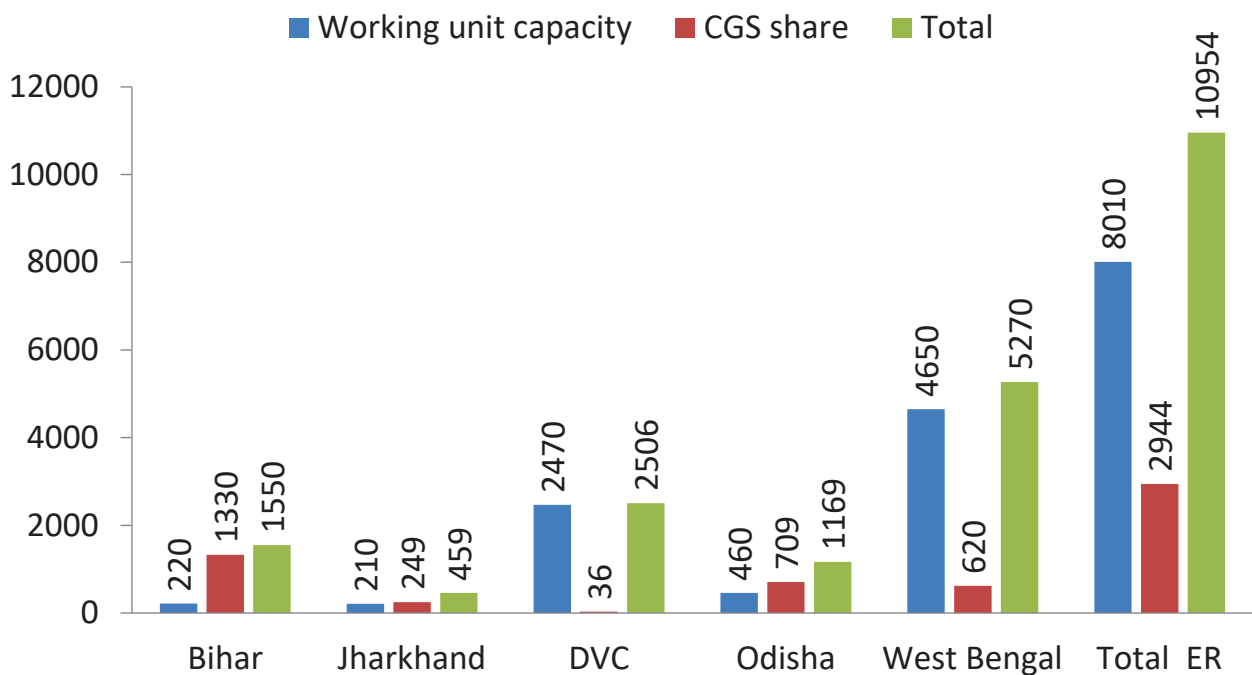


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Adequacy short fall (based on installed capacity and CGS share)



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Power Plant close to Load centre West Bengal



Sl No	Developer	Name of Project	Unit No	Total Capacity
1	WBPDC	BANDEL TPS	1	60
2	WBPDC	BANDEL TPS	2	60
3	WBPDC	BANDEL TPS	3	60
4	WBPDC	BANDEL TPS	4	60
5	WBPDC	BANDEL TPS	5	210
6	WBPDC	KOLAGHAT TPS	1	210
7	WBPDC	KOLAGHAT TPS	2	210
8	WBPDC	KOLAGHAT TPS	3	210
9	WBPDC	KOLAGHAT TPS	4	210
10	WBPDC	KOLAGHAT TPS	5	210
11	WBPDC	KOLAGHAT TPS	6	210

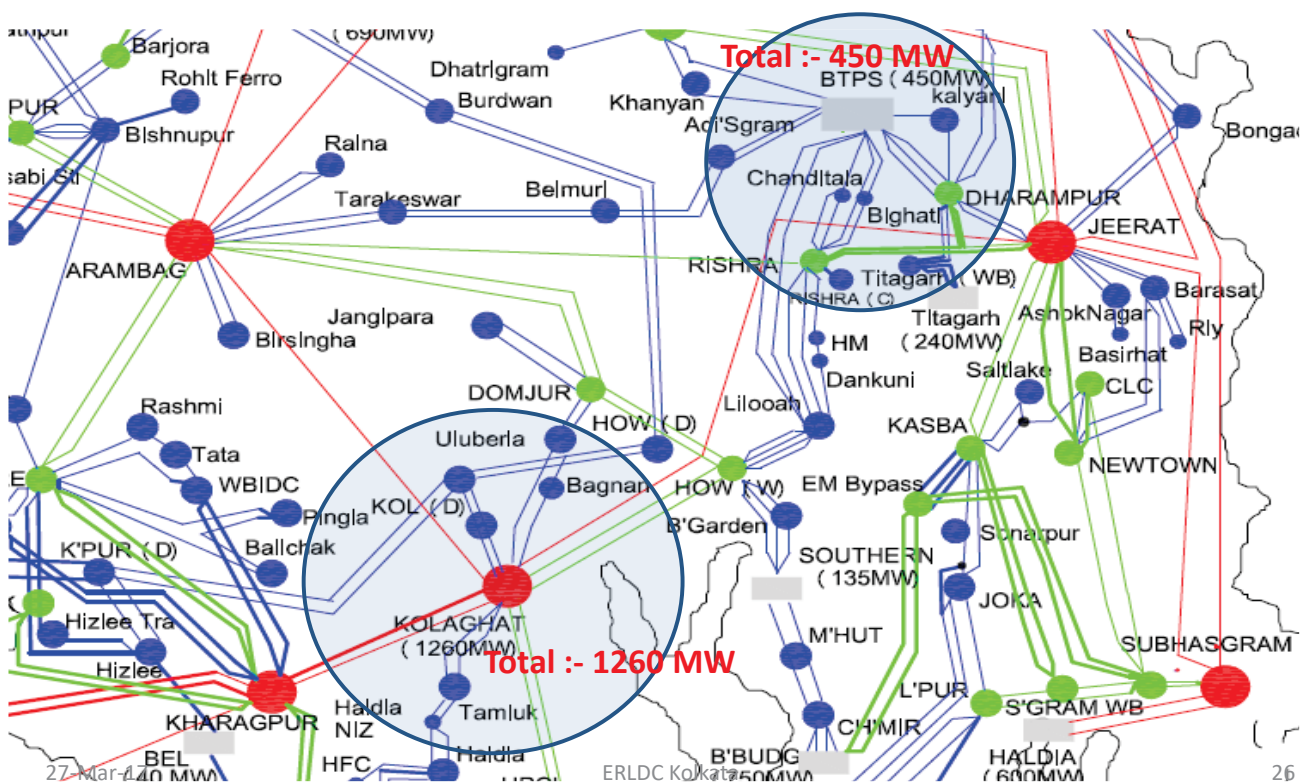
Sub total :- 1710MW

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Power Plant close to Load centre West Bengal



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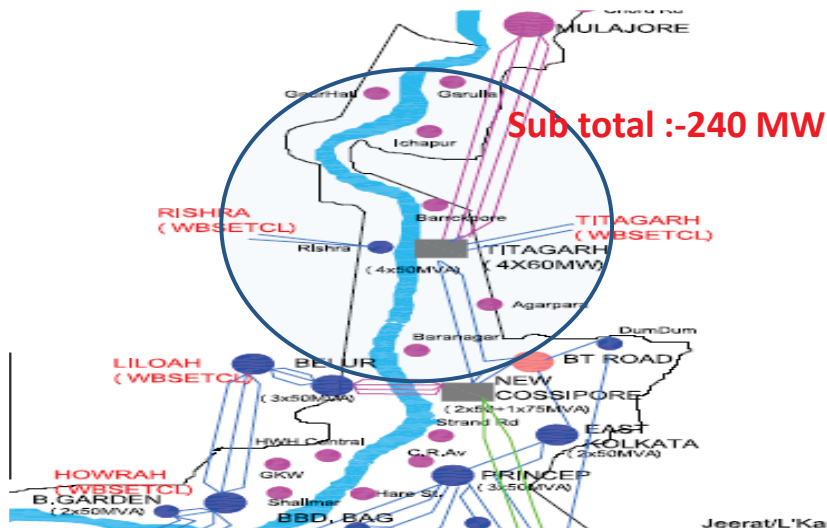
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Power Plant close to Load centre



CESC

SI No	Developer	Name of Project	Unit No	Total Capacity
12	C.E.S.C. Pvt.	TITAGARH TPS	1	60
13	C.E.S.C. Pvt.	TITAGARH TPS	2	60
14	C.E.S.C. Pvt.	TITAGARH TPS	3	60
15	C.E.S.C. Pvt.	TITAGARH TPS	4	60



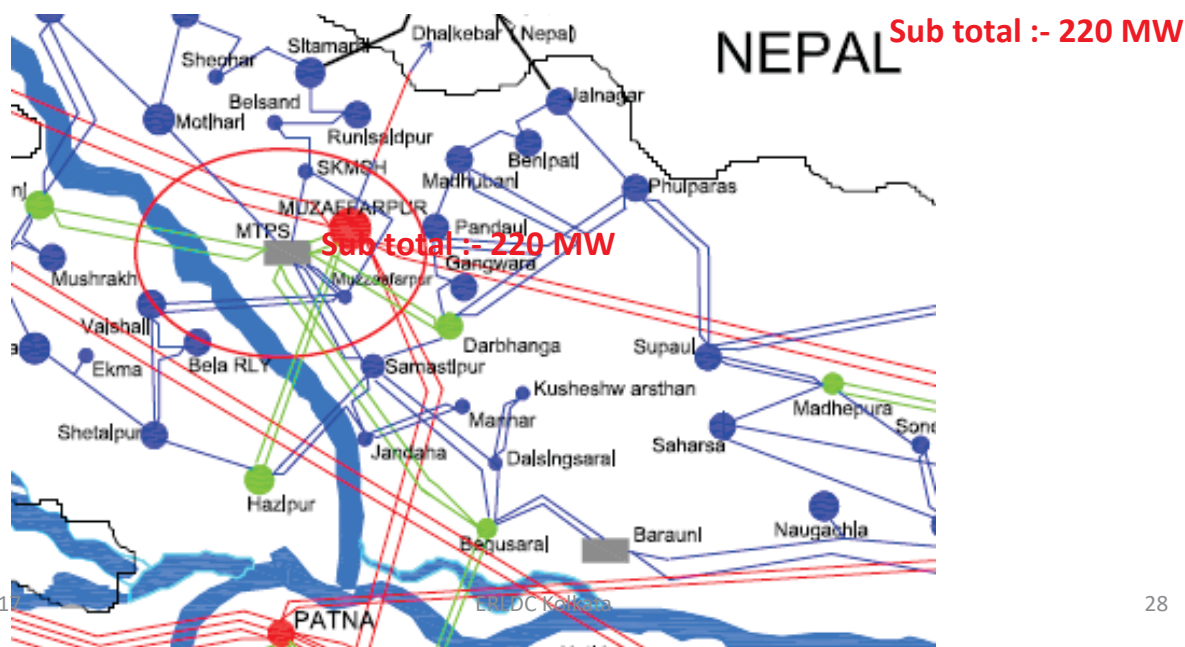
Sub total :-240 MW

Power Plant close to Load centre



Bihar

SI No	Developer	Name of Project	Unit No	Total Capacity
16	NTPC & Bihar	MUZAFFARPUR TPS	2	110
17	NTPC & Bihar	MUZAFFARPUR TPS	1	110





Power Plant close to Load centre DVC

Sl. No.	Name of Utility	Name of Project	Unit No.	Capacity (MW)
1	D.V.C	BOKARO 'B' TPS	1	210
2	D.V.C	BOKARO 'B' TPS	2	210
3	D.V.C	BOKARO 'B' TPS	3	210
4	D.V.C	MEJIA TPS	1	210
5	D.V.C	MEJIA TPS	2	210
6	D.V.C	MEJIA TPS	3	210
7	D.V.C	MEJIA TPS	4	210
8	D.V.C	MEJIA TPS	6	250
9	D.V.C	MEJIA TPS	5	250
10	D.V.C	CHANDRAPURA	7	250
11	D.V.C	CHANDRAPURA	8	250

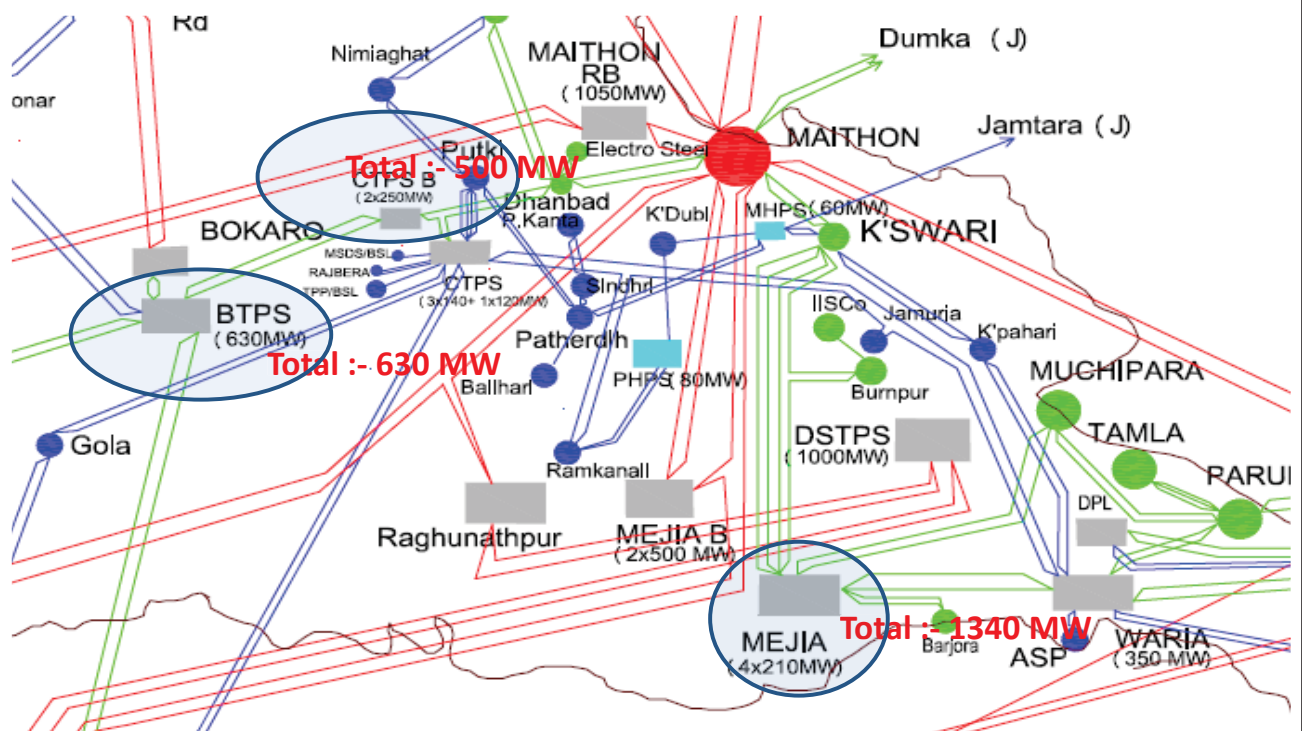
27-Mar-17

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Sub total :- 2470 MW

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Power Plant close to Load centre DVC



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Sub total :- 2470 MW

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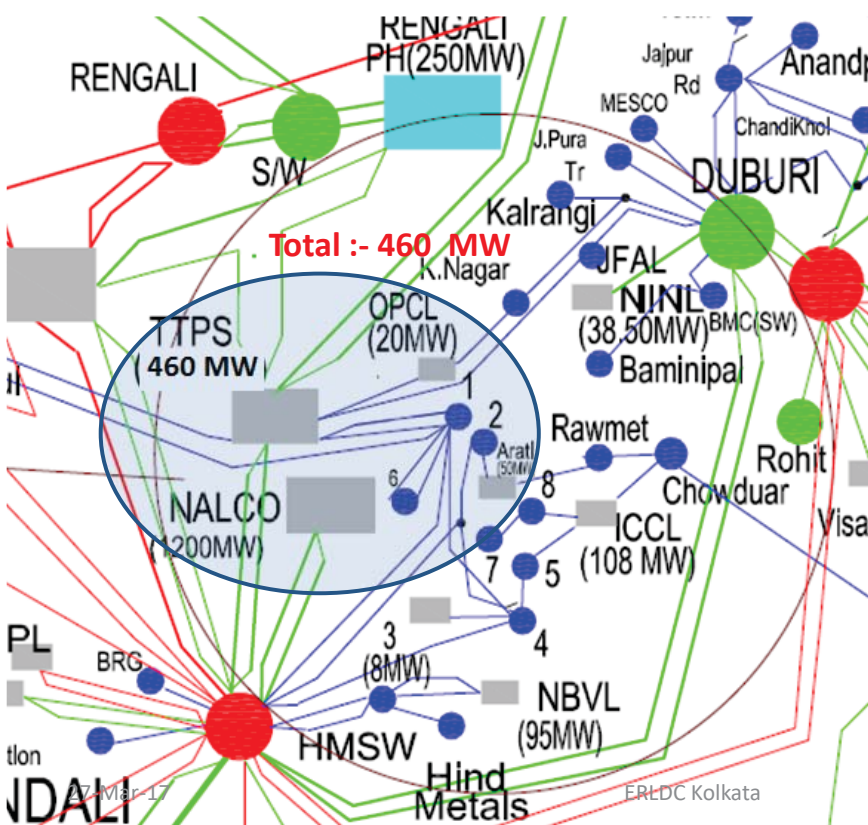
Power Plant close to **Load centre** Odisha

SI No	Developer	Name of Project	Unit No	Total Capacity
1	NTPC	Talcher TPS Old	1	60 MW
2	NTPC	Talcher TPS Old	2	60 MW
3	NTPC	Talcher TPS Old	3	60 MW
4	NTPC	Talcher TPS Old	4	60 MW
5	NTPC	Talcher TPS Old	5	110 MW
6	NTPC	Talcher TPS Old	6	110 MW

Sub total :- 460 MW

Cumulative capacity of all power plant close to load centre :- 5100MW

Power Plant close to **Load centre** Odisha



Cumulative capacity of all power plant close to load centre 5100 MW

Change in **fault level** with decommissioning of units



SI No	Voltage(kV)	Unit Rating	Change in Fault MVA
1	132	60	200
2	132	110	320
3	132	130	400
4	220	210	600
5	400	210	600

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Anticipated impact on system operation (with present network) due to decommissioning of load-centre units



Plant	Effects
Decommissioning of Bandel units	High Loading of 220/132kV ATRs at Satgatchhia , Dharampur & Rishra. Low voltage problem anticipated at Bandel, Kalyani, Chanditala, Bighati, Adisaptagram, Belmuri etc.
Decommissioning of KTPS units	High loading of KTPS 400/220kV ICTs ; low voltage at Howrah, Bagnan, Uluberia etc.
Decommissioning of Bokaro-B units	High loading of 220kV CTPS-Bokaro and 220kV Joda-Jindal-Jamshedpur lines. Low voltage at Bokaro, Hazaribagh, Konar, Barhi, Ramgarh, Jamshedpur
Decommissioning of TTPS units	May cause high loading of 220kV Ramchandrapur-Joda S/C line, 220/132kV ATRs at TTPS and low voltage in 132kV system downstream of TTPS

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Summary Phasing out criteria: Prioritization



- Adequacy
- **Present Generation level**
- Connectivity at different voltage level
- **Vintage**
- Proximity of load centre
- **MOD**
- Level of SPM
- **Fault MVA**



Thank you