वार्षिक प्रशासन रिपोर्ट

Annual Administration Report

2021-22

भारत सरकार

विद्युतमंत्रालय

पूर्वी क्षेत्रीय विद्युत समिति

कोलकाता, अगस्त–2022

GOVT. OF INDIA

MINISTRY OF POWER

EASTERN REGIONAL POWER COMMITTEE

KOLKATA, AUGUST - 2022

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Govt. of India
Ministry of Power
ERPC, Kolkata

FOREWORD

After witnessing a lean period in the Electricity Sector primarily due to COVID pandemic, the year 2021 has placed exceptional demands on electricity which is continued in the year 2022 even with more pace.

The per capita electricity consumption of Eastern Region during the year 2021-22 was 807 kWh against the 1255 kWh of All India. However, since last several years, Eastern region witnessed a considerable growth in electricity demand. During the year 2021-22, Peak Demand Met of the Region has surpassed the 25,000 MW with annual growth of 4.7% and energy consumption of the Region has reached at 164 BU with annual growth rate of 11 %.

During the year 2021-22, total electricity generation in ER was 222 BU in which 87% were met by Thermal, 12.5 % by Hydro and merely 0.5 % by Renewable Energy Sources (RES). Coal still plays a major role in the expansion of electricity generation, and remains the largest single fuel in the energy mix of Eastern Region as well as our country. Eastern Region is bestowed with high reserve of coal and water availability, which are basic need for thermal power generation. Therefore, more pithead generating plants are need of the hour to cater the growing demand in Eastern Region as well as country. To address the fluctuation in Renewable power, provision for more Pumped Storage Plant (PSP) in the Region is to be expedited.

I hope, the growth of electricity demand and consumption will continue to grow further and ERPC will not left any stone untuned to bring stability and smooth operation of the Eastern grid as well as integrated grid.

I express my sincere thanks to all the Members of ERPC and ERPC Secretariat for their great effort for timely preparation of Annual administrative Report 2021-22.

(Avinash Kumar), IAS
CMD (JUVNL) & Chairman (ERPC)

Govt. of India
Ministry of Power
ERPC, Kolkata

PREFACE

The annual Administration Report of Eastern Region Power Committee (ERPC) for the year 2021-22 has been prepared after analysing and compiling the data provided by various utilities, Grid Operators, etc. It gives a useful insight into the grid parameters, major achievements, important incidents, crucial decisions and various affairs of Eastern Regional Power Committee during the year 2021-22.

ERPC plays a pivotal role in taking up the matters concerning the stability and smooth operation of the integrated grid and economy and efficiency in the operation of the Power System in Eastern Region.

The various profiles of the grid parameters in the Eastern Region (ER) have registered improvements in the year 2021-22. The region has witnessed 2620 MW capacity addition in Thermal, 113 MW in Hydro and 227.5 MW in Renewable Energy. With such considerable capacity addition, the installed capacity in the ER reached at 40, 000 MW.

The gross electricity generation of the region was 2,22,355 MU which includes import from Bhutan also. The net export to other Regions, Bangladesh & Nepal was 55,963 MU which was 14.6% more than the previous year. Around 6478 MU energy was exported to Bangladesh through 400 kV D/C Berhampur (WB) – Bheramara (Bangladesh) transmission line. However, energy exported to Nepal during the year was 1047 MU through 400 kV (charged at 220 kV) Muzaffarpur – Dhalkheber (Nepal) line started since February'2016.

Maximum Demand Met in ER was 25,145 MW on 16.07.2022 at 22:00 Hrs. which was 4.7 % more than the previous year. Daily net average energy consumption in the region was about 450 MU, which was 10.8 % more than the previous year.

I believe, the Annual Administrative Report 2021-22 contains valuable data and analysis which would prove to be informative and useful for the stakeholders of the Eastern Region. I would like to thank all the constituents of the Eastern Region for their timely submission of requisite data to prepare the report. ERPC Secretariat would continuously strive to improve this Report. For this I would like to invite suggestions for making this report more informative and attractive.

Disclaimer: This is an operational report. Data/information furnished in this report should not be used for any commercial purposes.

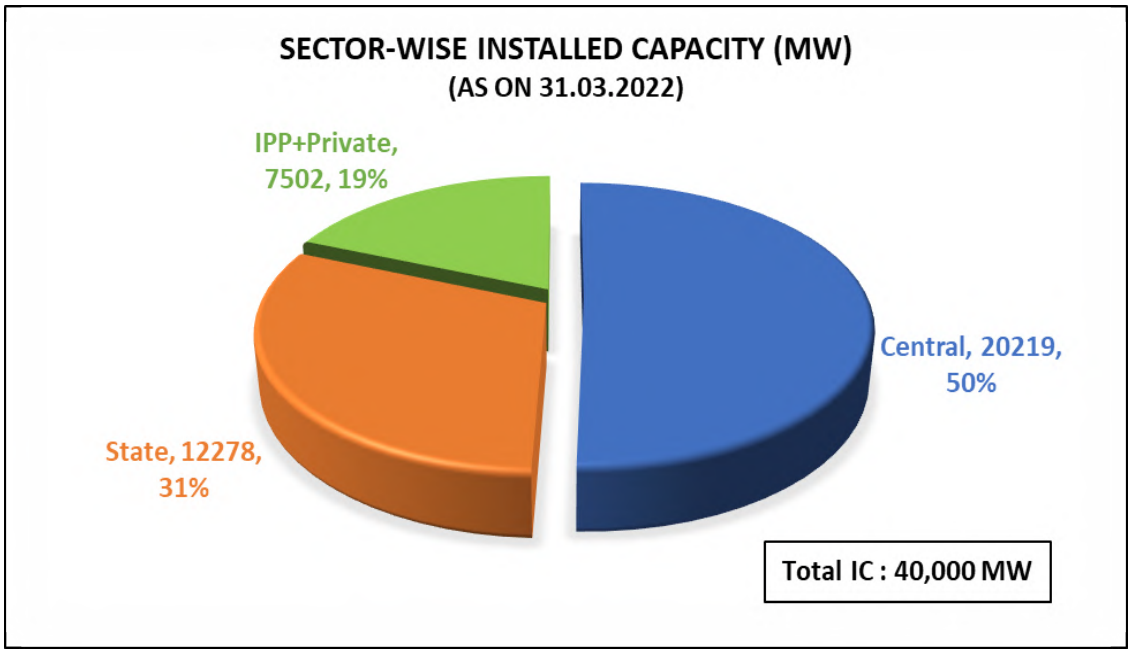
(N. S. Mondal)
Member Secretary (ERPC)

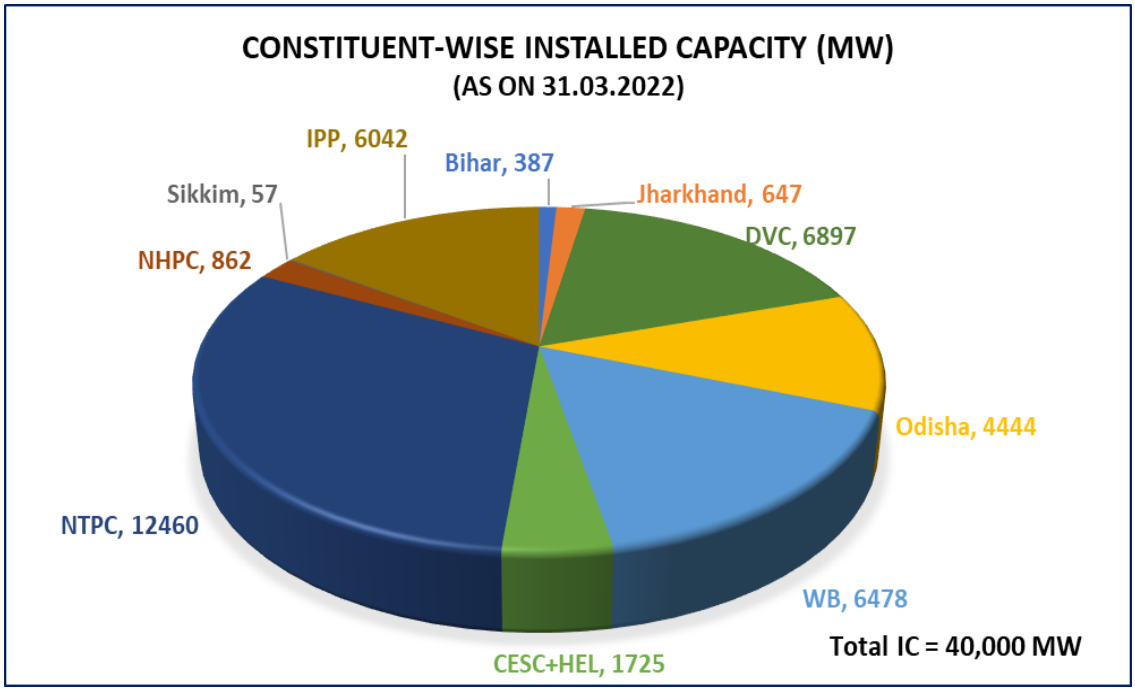
HIGHLIGHTS

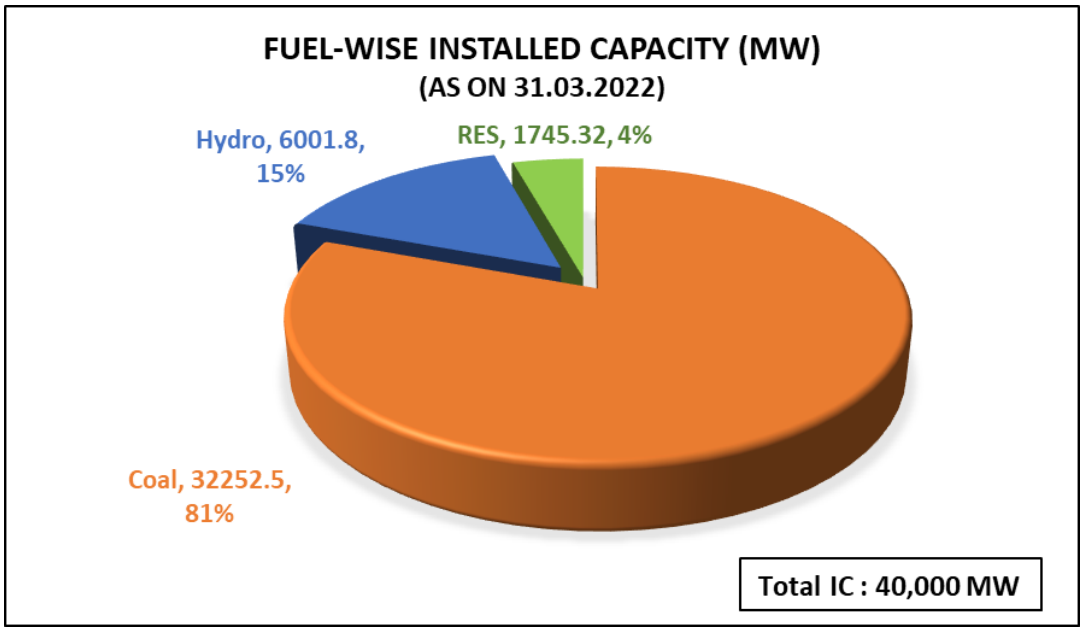
Salient features of ER Grid During 2021-22

Installed Capacity (As on 31.03.2022)	
Thermal	32253 MW
Hydro	6002 MW
Solar	1745 MW
Capacity addition (Thermal) During 2021-22	2620 MW
Capacity addition (Hydro) During 2021-22	113 MW
Capacity retired (Thermal) during 2021-22	1370 MW
Total Installed Capacity (Thermal + Hydro + Solar)	**40000 MW**
Total Effective Capacity (Thermal + Hydro + Solar)	**39842 MW**
Demand	
Max. of monthly Peak Demand Met (On 16.07.2021 at 22:00 Hrs)	**25145 MW**
Increase Over Previous Year	4.70 %
Min. of monthly Peak Demand Met (On 23.10.2021 at 19:00 Hrs.)	20631 MW
ER System Load Factor (%)	**74.5 %**
Energy Requirement	**165200 MU**
Energy Generation (Gross) (incl. Bhutan Imp, Excl. CPP)	222355.5 MU
Increase over previous year	12.2 %
Net Energy Met (incl. HVDC S/S drawal)	**164146 MU**
Frequency Regime	
% Time frequency remained Below 49.9 Hz	7.52 %
Between 49.9-50.05 Hz (IEGC Band)	**75.05 %**
Above 50.05 Hz	17.43 %
Inter-regional / Outside Country Energy Exchange	
Net Energy export to WR	-2468.2 MU
Net Energy export to SR	19782.5 MU
Net Energy export to NR	29559 MU
Net Energy export to NER	1565 MU
Net Energy export to Bangladesh	6478 MU
Net Energy export to Nepal	1047 MU
Total Net Regional Export (Incl. Bhutan drawl of 228.7 MU)	**55963.7** MU

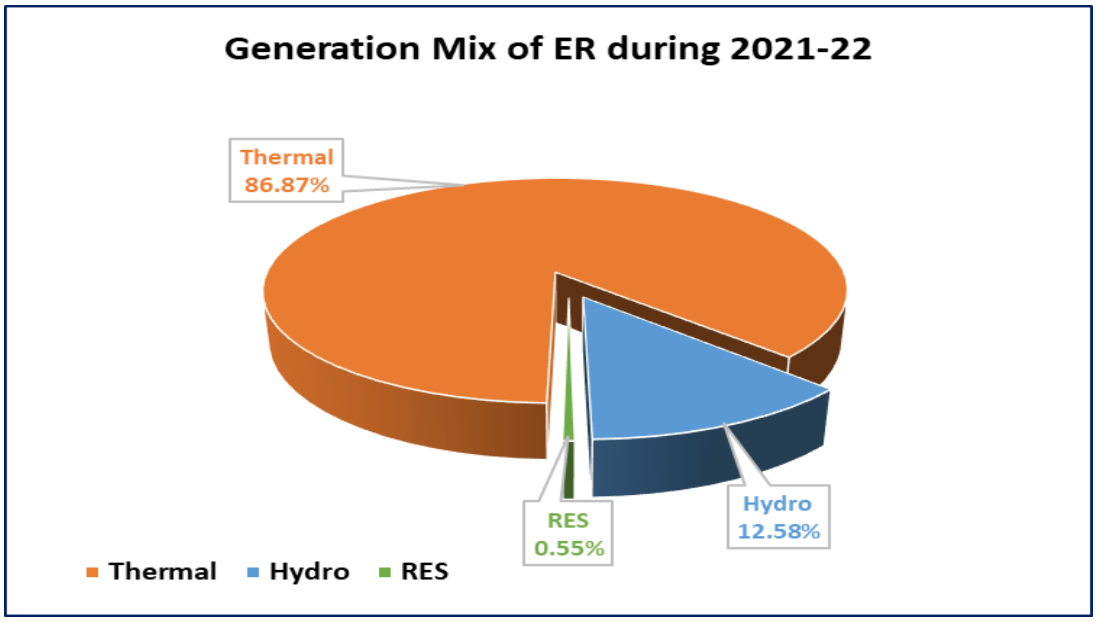
Installed Capacity in Eastern Region as on 31.03.2022



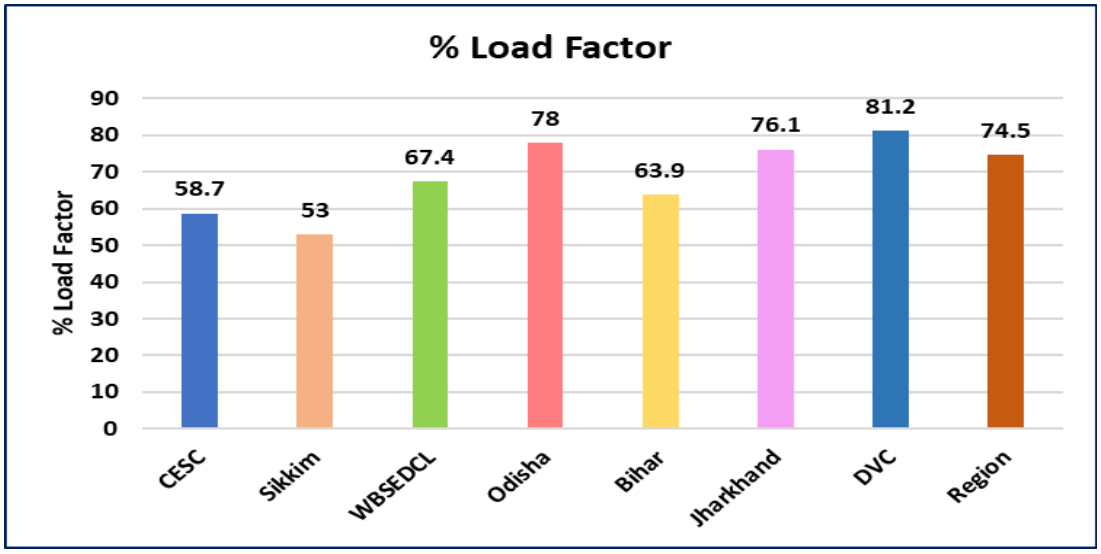




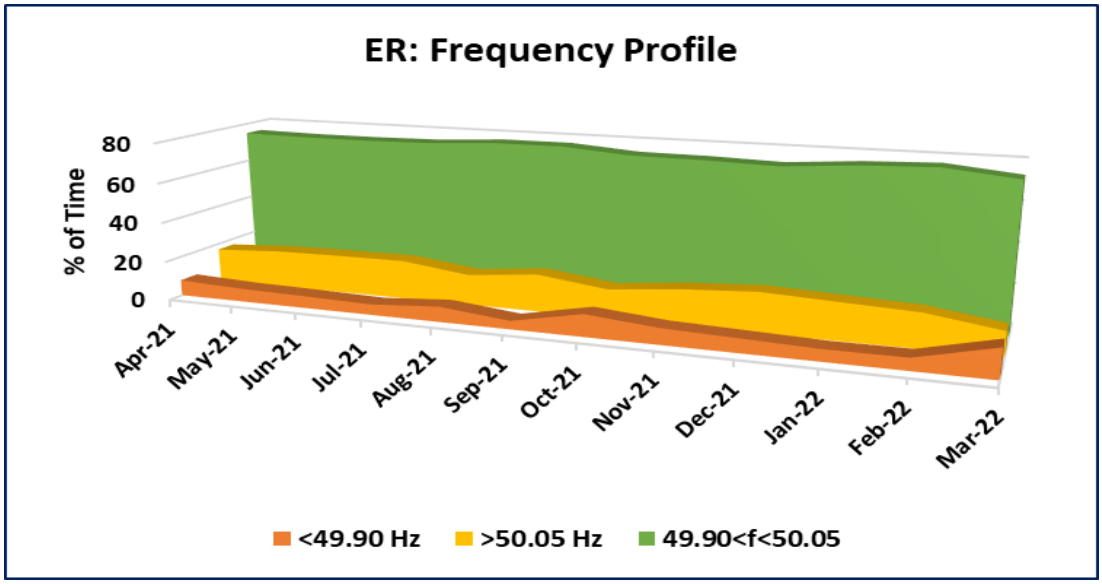
Generation Mix of Eastern Region during the Year 2021-22



Annual Load Factor of the Constituents in Eastern Region during the Year 2021-22



Eastern Grid Frequency Regime During the Year 2021-22



CHAPTER-1

CONSTITUTION, FUNCTIONS AND ORGANISATIONAL SETUP

1.1 INTRODUCTION

Electricity is the key to economic development of the country and is one of the most essential elements for growth of a country and development of modern society. Accordingly, electricity demand is increasing day by day with improvement in living standards as the nation modernizes and its economy develops. To meet the challenges of ever-growing demand, power sector has become the key area for reforms as well as to attract investment. Enactment of Electricity Act, 2003, has brought revolutionary changes in almost all the areas of the power sector. Through implementation of this Act conducive environment has been created to promote private sector participation and competition in the sector. This has led to significant investment in generation, transmission and distribution areas.

For efficient & integrated system planning and operational purposes, the power system of the country has been divided into five regions namely Northern Region, Southern Region, Western Region, Eastern Region and North-Eastern Region. Each region has its own regional power grid. Initially, State grids were inter-connected to form the regional grid. The integration of regional grids, and thereby establishment of National Grid, was conceptualized in early nineties. Initially inter-regional links were planned for exchange of operational surpluses amongst the regions. Subsequently, it was felt that synchronisation of all regional grids would help in optimal utilization of scarce natural resources by transfer of power from resource centric regions to load centric regions. Further, this should pave the way for establishment of vibrant electricity market facilitating trading of power across regions.

The integration of regional grids which began with asynchronous HVDC back-to-back inter-regional links facilitating limited exchange of regulated power subsequently graduated to high capacity synchronous links between the regions. In October, 1991 North Eastern and Eastern grids were connected. In March, 2003 WR and ER-NER were interconnected. On 26th August, 2006 North and East grids were interconnected thereby four regional grids Northern, Eastern, Western and North-Eastern grids were synchronously connected forming Central Grid (NEW GRID) operating at one frequency. On 31st December, 2013 Southern Region was connected to Central Grid (NEW GRID) in synchronous mode with the commissioning of 765kV Raichur-Solapur Transmission line, thereby achieving 'ONE NATION'-'ONE GRID'-'ONE FREQUENCY'.

The Eastern Region comprises of the States of Bihar, Jharkhand, Odisha, West Bengal and Sikkim. The region has an area of 4,25,432 Sq. km which is about 13% of the total area of the country.

The Regional Power Committees have been established by Central Government for a specified region for facilitating the integrated operation of the power system of that region. The Eastern Regional Power Committee (ERPC) is one out of five (5) Regional Power Committees.

The Organisation Chart of ERPC Secretariat is given at **Exhibit-I** & Power Maps showing transmission system of the Eastern Region are given at **Exhibit – II.**

1.2 CONSTITUTION

Eastern Regional Power Committee (ERPC) is the present form of erstwhile Eastern Regional Electricity Board (EREB). Initially EREB came into operation on 01.06.1965 in accordance with the Govt. of India's resolution no. EL-II-35 (7)/63 dated 6th March, 1964 in order to promote integrated operation of the power systems in the region and to ensure optimum utilisation of the generation in the region. Government of India, under the provision of Sub-Section 55 of Section 2 of the Electricity Act 2003 vide Resolution F.No.23/1/2004-R&R dated 25th May, 2005 had established Eastern Regional Power Committee comprising the states of Bihar, Jharkhand, Orissa, West Bengal and Sikkim with following members and was subsequently amended from time to time on 29.11.2005, 08.05.2008 and 21.12.2017.

i) Member (Grid Operation), Central Electricity Authority (CEA).
ii) One representative each of Central Generating Companies, Central Transmission Utility (CTU), National Load Despatch Centre (NLDC) and the Eastern Regional Load Despatch Centre (ERLDC).
iii) From each of the States in the region, the State Generating Company, State Transmission Utility (STU), State Load Despatch Centre (SLDC), one of the State-owned distribution companies as nominated by the State Government and one Distribution Company by alphabetical rotation out of the private distribution companies functioning in the region.
iv) A representative each of every generating company (other than central generating companies or State Government owned Generating Companies) having more than 1000 MW installed capacity in the region.
v) A representative of the generating companies having power plants in the region [not covered in (ii) to (iv) above] by alphabetical rotation.
vi) One member representing the electricity traders in the region by alphabetical rotation which has trading volume of more than 500 million units during the previous financial year.
vii) A representative each of every Nodal Agency appointed by the Government of India for coordinating cross-border power transactions with the countries having electrical inter-connection with the region.
viii) Member Secretary, ERPC – Convener.

It is further stated in the notification that wherever a member is represented by rotation, the nomination would be for a period of one year. The representative from respective organizations should be either the head of the organization or at least a person not below the

rank of a Director on the Board of the company / corporate entity except for Central Public Sector Undertaking (CPSUs) where representative could also be at the level of Executive Director.

Chairperson of the ERPC would represent the States of the region by rotation in alphabetical order. Members of the ERPC from the particular State would nominate the Chairperson of ERPC from amongst themselves. Term of the Chairperson would be for a period of one year.

Shri Sanjeev Hans (IAS), CMD, Bihar State Power Holding Company Ltd. was the Chairperson of ERPC for the year 2021-22. Members of ERPC for the year 2021-22 were as under:

Sl.No.	Name of ERPC Member Organisation	Designation of the Member
1.	West Bengal State Electricity Distribution Company Ltd.	Chairman-cum-Managing Director
2.	Energy &Power Department, Govt. of Sikkim	Principal Chief Engineer-cum-Secretary
3.	GRIDCO Ltd.	Chairman-cum-Managing Director
4.	Odisha Power Transmission Corporation Ltd.	Chairman-cum-Managing Director
5.	Odisha Hydro Power Corporation Ltd.	Chairman-cum-Managing Director
6.	Odisha Power Generation Corporation Ltd.	Managing Director
7.	Bihar State Power Holding Company Ltd.	Chairman-cum-Managing Director
8.	Bihar State Power Transmission Company Ltd.	Managing Director
9.	North Bihar Power Distribution Company Ltd.	Managing Director
10.	Jharkhand Urja Vikas Nigam Limited	Chairman-cum-Managing Director
11.	Jharkhand Urja Sancharan Nigam Limited	Managing Director
12.	Jharkhand Bijli Vitaran Nigam Limited	Managing Director
13.	Tenughat Vidyut Nigam Ltd.	Managing Director
14.	West Bengal State Electricity Transmission Company Ltd.	Managing Director
15.	West Bengal Power Development Corporation Ltd.	Chairman & Managing Director
16.	Durgapur Projects Ltd.	Managing Director
17.	Damodar Valley Corporation	Chairman
18.	Central Electricity Authority	Member (GO&D)
19.	Eastern Regional Load Despatch Centre	ED, ERLDC
20.	National Load Despatch Centre	ED, NLDC
21.	NTPC Ltd.	Director (Commercial)
22.	NHPC Ltd.	Director (Finance)
23.	Power Grid Corporation of India Ltd.	Director (Operations)
24.	PTC India Ltd.	Director (C&O)
25.	NTPC Vidyut Vyapar Nigam Ltd.	Chief Executive Officer
26.	Tata Power Trading Company Ltd.	Managing Director
27.	CESC Ltd.	Managing Director
28.	Maithon Power Ltd.	Chief Executive Officer
29.	Adhunik Power & Natural Resources Ltd.	Managing Director
30.	GMR Kamalanga Energy Ltd.	Chief Operating Officer
31.	Jindal India Thermal Power Ltd.	Chief Executive Officer
32.	Teesta Urja Ltd.	Managing Director

1.3 FUNCTIONS

The functions of ERPC as per the resolution of Govt. of India dated 25.05.2005 amended vide resolution dated 29.11.2005 and the revised Indian Electricity Grid Code issued by CERC effective from 01.04.2006 are given below:

- Clause 29 (4) of the Act provides that "the Regional Power Committee in the region may, from time to time, agree on matters concerning the stability and smooth operation of the integrated grid and economy and efficiency in the operation of the power system in that region."

- As per Para (6) of the MOP Resolution dated 25.5.2005, ERPC Secretariat shall discharge the following functions: -

    - To undertake Regional Level operation analysis for improving grid performance
    .
    - To facilitate inter-state / inter-regional transfer of power.

    - To facilitate all functions of planning relating to inter-state / intra-state transmission system with CTU / STU.

    - To coordinate planning of maintenance of generating machines of various generating companies of the region including those of inter-state generating companies supplying electricity to the Region on annual basis and also to undertake review of maintenance programme on monthly basis.

    - To undertake planning of outage of transmission system on monthly basis.

    - To undertake operational planning studies including protection studies for stable operation of the grid.

    - To undertake planning for maintaining proper voltages through review of reactive compensation requirement through system study committee and monitoring of installed capacitors.

    - To evolve consensus on all issues relating to economy and efficiency in the operation of power system in the region.

- Besides, as per the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010, following specific functions have been entrusted to RPC Secretariat:

    - RPC Secretariats shall carry out all Regional Energy Accounting calculations.

- Regional Energy Accounts on monthly basis shall be prepared and issued by the RPC Secretariats for the purpose of billing and payment of various charges.

- RPC Secretariat shall prepare and issue the Unscheduled inter-change (UI) account [newly terminology 'Deviation Settlement Mechanism (DSM)] for which RLDC will provide actual net injection / drawal of concerned regional entities, 15 minute-wise, based on the above meter readings on a weekly basis by each Thursday noon for the seven days period ending on the previous Sunday mid-night.

- RPC Secretariat shall monitor the status of UI payment and installation of capacitor.

- RPC Secretariat shall prepare and issue monthly Regional Transmission Accounts (RTA) and Regional Transmission Deviation Accounts (RTDA) based on data supplied by NLDC and ERLDC respectively.

- RPC Secretariat shall also issue the weekly statement for VAR charges, to all regional entities who have a net drawal / injection of reactive energy under low/high voltage conditions.

- RPC Secretariat shall decide from time to time to utilize the money remaining in the regional reactive account after payout of all VAR charges upto 31st March of every year for training of the SLDC operators and other similar purposes which would help in improving/streamlining the operation of the respective regional grids

- The Regional Power Committee (RPC) Secretariat in the region shall continuously monitor the instances of non-compliance of the provisions of IEGC and try to sort out all operational issues and deliberate on the ways in which such cases of non-compliance are prevented in future by building consensus.

- RPC Secretariat shall decide on installation of capacitors by states vis-à-vis the requirement/targets.

- RPC Secretariat in consultation with RLDC finalise the quantum and time frame for reactive compensation.

- RPC Secretariat shall regularly monitor the status regarding the installation and healthiness of the reactive compensation equipment.

- RPC Secretariat shall finalise action plan and give instructions to restore power system elements under prolonged outage in a specified time period.

- RPC Secretariat will be allowed to carry out checking of Power System Stabilizers (PSS) in AVRs of generating units and further tuning it, whenever considered necessary.

- RPC Secretariat will finalise the plan for providing automatic under-frequency and df/dt relays for load shedding in respective systems, to arrest frequency decline that could result in a collapse/disintegration of the grid and shall ensure that the above under-frequency and df/dt load shedding/islanding schemes are always functional.

- RPC Secretariat shall carry out periodic inspection of the under-frequency relays and maintain proper records of the inspection.

- RPC Secretariat shall decide and intimate the action required by Utility constituents, distribution licensee and STUs to get required load relief from Under Frequency and df/dt relays.

- RPC Secretariat shall finalise the voltage control measures through voltage relay to prevent voltage collapse / cascade tripping.

- RPC Secretariat shall finalise the loads to be shed through under frequency relays / df/dt relays and System Protection Scheme in order to maintain the frequency within the stipulated band and maintaining the network security.

- RPC Secretariat shall monitor the forced outages of important network elements in the grid.

- The RPC Secretariat shall be primarily responsible for finalization of the annual outage plan for the following financial year by 31st January of each year and reviewed during the year on quarterly and Monthly basis.

- RPC Secretariat shall submit quarterly, half-yearly reports to the Commission indicating deviation in outages from the plan along with reasons.

- RPC Secretariat shall provide aid for finalising detailed plans and procedures for restoration of the regional grid under partial/total blackout and shall be reviewed / updated annually.

- RPC Secretariat shall initiate investigation/action whether any of the regional entities are indulging in unfair gaming or collusion if such practice is detected and reported.

- RPC Secretariat shall discharge any other responsibilities assigned by CERC.

Subsequently through further amendments following works were also entrusted to RPCs:

IEGC 2010, 1st Amendment:

The RPC Secretariat shall be primarily responsible for finalization of the Annual Load Generation Balance Report (LGBR) and the annual outage plan for the following financial year by 31st December of each year. The LGBR shall be prepared by the respective RPC secretariat for peak as well as off-peak scenarios.

IEGC 2010, 4th amendment:

The RPC Secretariat shall calculate Compensation for generating stations for degradation of Station Heat Rate (SHR), Auxiliary Energy Consumption and Secondary Fuel Consumption due to low unit loading operation as per the mechanism framed by the CERC.

Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015:

The Regional Power Committees shall issue an Ancillary Services Statement along with the Deviation Settlement Mechanism Account.

1.4 ORGANISATIONAL STRUCTURE

Chairperson of ERPC would represent the states of the region by rotation in alphabetical order. Members of ERPC of that particular state would nominate the Chairperson of ERPC from amongst themselves. Term of the Chairperson would be for a period of one year.

Member Secretary who is an officer of Central Power Engineering Services (Group-A), is the administrative and technical head of ERPC Secretariat with the powers of the Head of Department. The other Group-A officers in the ERPC Secretariat also belong to Central Power Engineering Service (Group-A) Cadre.

Group-B officers in ERPC Secretariat are borne on the strength of CPES (Group-B) Cadre of the Govt. of India, while other Group – B, C and D (reclassified as Group-C) staff are on the strength of General Central Service of the Govt. of India.

The details regarding the present ERPC Secretariat officers and staff as on 31.03.2022 are given at **Annexure-I**.

Names of the Chairpersons and Member Secretaries of the ERPC and erstwhile EREB, since inception, are shown in **Annexure-II** and **Annexure-III,** respectively.

1.5 DETAILS OF BUDGET & EXPENDITURE FOR 2021-22

The sanctioned budget (RE) of ERPC for the year 2021-22 vis-à-vis actual expenditure for the same period is given in table:

Major Head 2801 (Non-plan): Regional Co-ordination (RC)

(Figures in Lakh of Rs.)

Sl. No.	Sub-Head	Item	Sanctioned Budget (RE) for 2021-22	Actual Expenditure for 2021-22
1	07.01.01	Salaries	222.21	207.68
2	07.01.06	Medical Treatment	6.20	2.47
3	07.01.11	Domestic TE	9.00	5.61
4	07.01.13	Office Expenses	44.76	22.28
5	07.01.14	Rent/Rates/Taxes	1.50	0.27
6	07.01.27	Minor Works	6.00	1.30
7	07.01.50	Other Charges	2.50	0.66
Total			**292.17**	**240.27**

CHAPTER-2

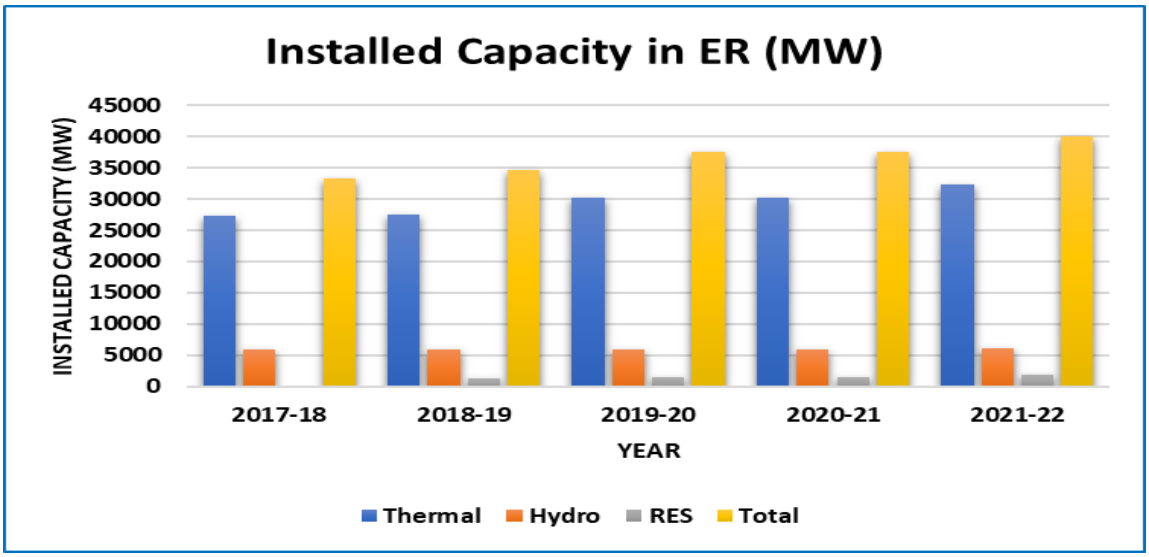
GRID PERFORMANCES

2.1 INSTALLED CAPACITY

The installed capacity of the power generating units in Eastern Region connected to Eastern grid as on 31st March 2022 was 40,000 MW, comprising 32,253 MW (80.6%) of thermal, 6002 MW (15 %) of hydel, 1745 MW (4.4 %) RES. The total effective capacity of the Region as on 31.03.2022 was 39,967 MW. In addition to this, Chukkha HEP, Kurichhu HEP, Tala HEP, Daghachu HEP & Mangdechhu HEP of Bhutan contributed about 270 MW, 60 MW, 1020 MW, 126 MW & 720 MW respectively of hydro power to Eastern Region. PTC is the nodal agency for facilitating power purchase from Chukha, Kurichhu, Tala & Mangdechhu HEPs and Tata Power Transmission Company Limited is the nodal agency for facilitating power purchase from Dagachu HEP in Bhutan. Constituent-wise installed and effective capacity as on 31.03.2022 are shown in **Annexure-IVA**. The growth in installed capacity in Eastern Region for last five years (i.e. 2017-2018 onwards) is given in Table and shown in the graph below:

Table: Installed capacity (MW) in Eastern Region for last five years

Type	2017-18	2018-19	2019-20	2020-21	2021-22
Thermal	27325	27415	30195	30195	32253
Hydro	5947	5876	5876.58	5877	6002
RES		1336	1488.68	1518	1745
Total	**33272**	**34627**	**37560.3**	**37590**	**40000**



The Compounded Annual Growth Rate of installed capacity in Eastern region during the last 5 years was 4.7 % as compared to 3.8 % nationwide.

2.2 POWER SUPPLY POSITION

2.2.1 GENERATION:

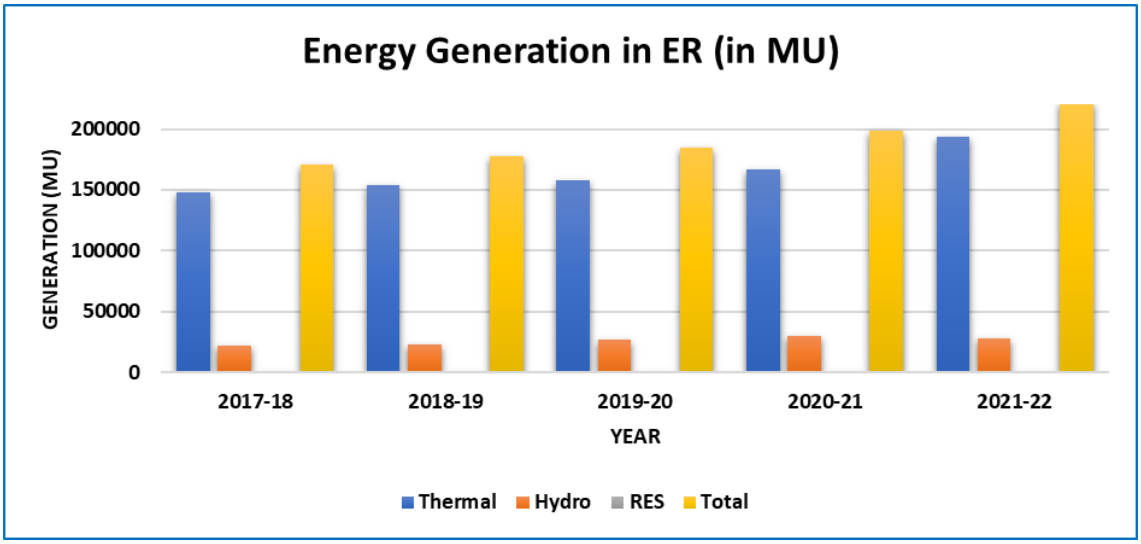
During the year 2021-22, the total generation availability in ER (including import from Bhutan but excluding generation/import from CPPs) was 2,22,355.6 MU (Gross) comprising of 1,93,170 MU from thermal (86.9 %), 27,969.5 MU from hydro (12.6 %) and 1,216 MU (0.5 %) from RES compared to total generation of 1,98,040 MU in 2020-21 comprising 1,66,906.1 MU from thermal, 30012 MU from hydro and 1121.4 MU from RES. The total generation was 24,316.5 MU (12.2%) more than that of 2020-21. Details of constituent-wise generation and auxiliary consumption are given in **Annexure-V**.

As regards to regional thermal generation, the generation of BSPHCL, DVC, WBPDCL, CESC, NTPC and IPP have increased considerably but that of Tenughat TPS has been declined as compared to last year. Hydro generation of IPPs has been increased considerably as compared to last year.

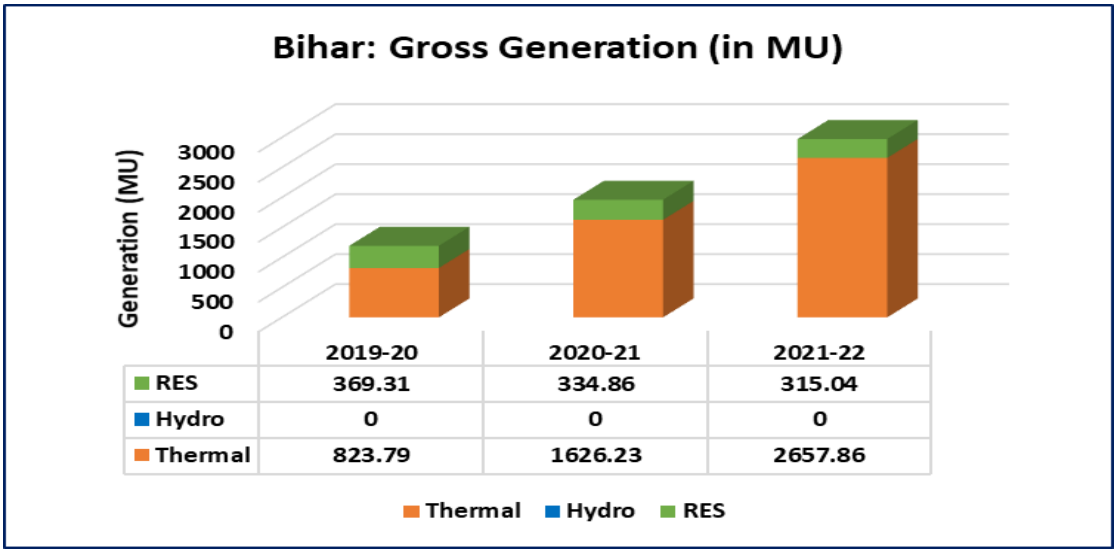
Generation of last five years (2017-18 to 2021-22) in the region is given in Table and shown in the graph below:

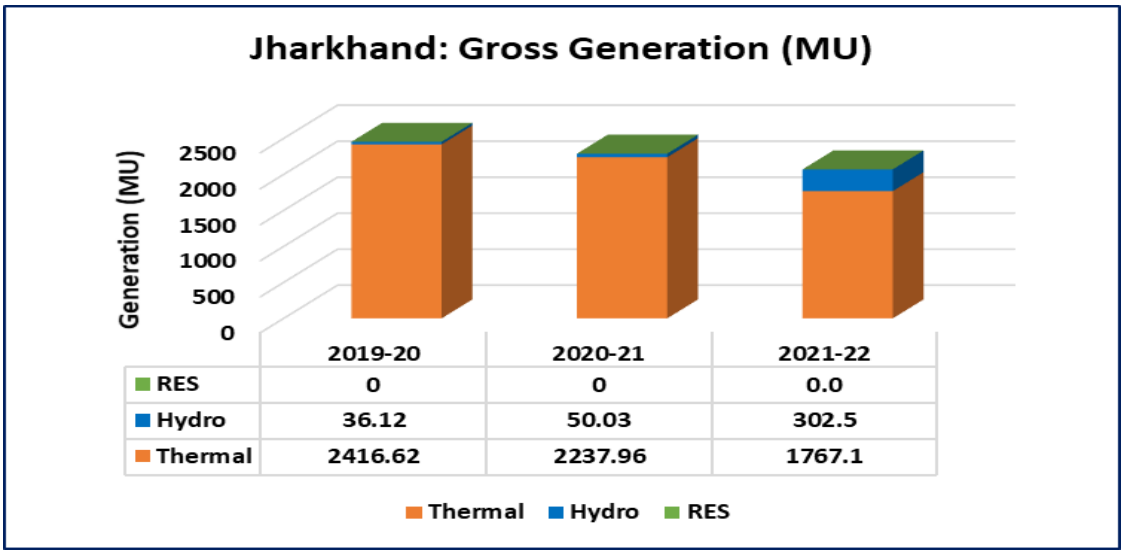
Table: Energy Generation in ER (in MU)

	2017-18	2018-19	2019-20	2020-21	2021-22
Thermal	148227.7	153810.6	157454.14	166906	193170
Hydro	22445.05	22968.09	26735.74	30012	27969.5
RES	171.63	657.48	905.19	1121	1216
Total	170844.4	177436.2	185095.07	198040	222355.5

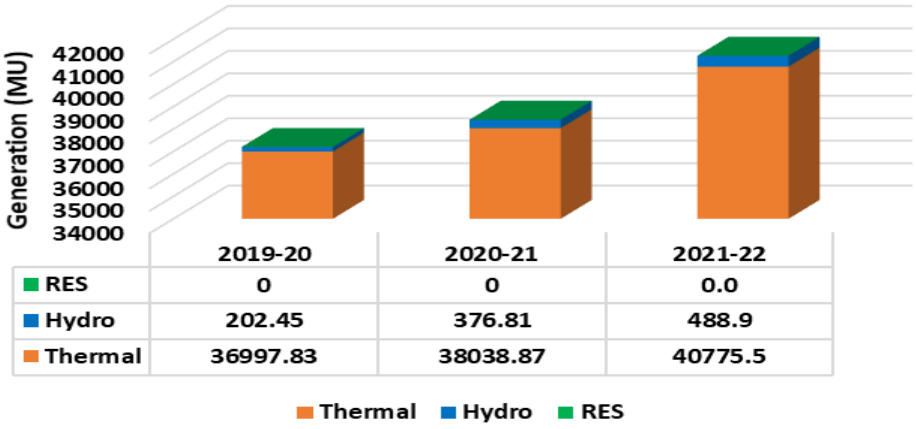


Constituent-wise & source-wise gross generation for the last three years has been shown below:





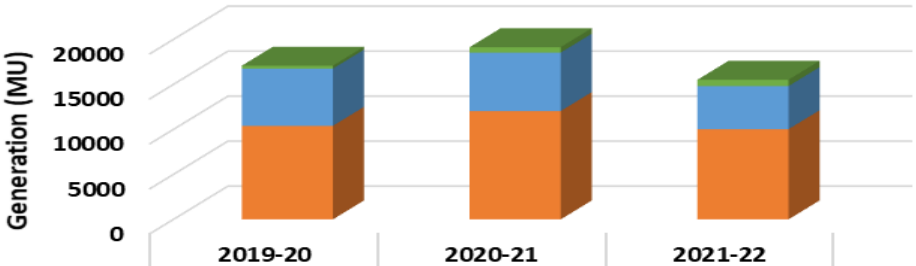
DVC: Gross Generation (MU)



	2019-20	2020-21	2021-22
RES	0	0	0.0
Hydro	202.45	376.81	488.9
Thermal	36997.83	38038.87	40775.5

Thermal Hydro RES

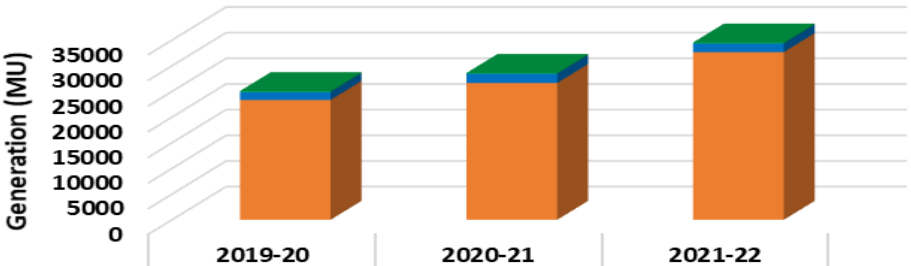
Odisha: Gross Generation (MU)



	2019-20	2020-21	2021-22
RES	324.7	601.42	700.2
Hydro	6356.88	6496.2	4789.2
Thermal	10396.28	12037.69	10024.0

Thermal Hydro RES

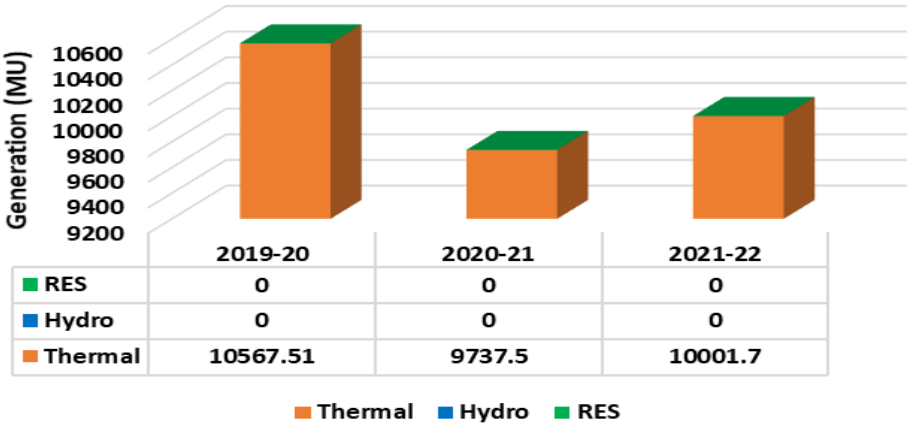
WB : Gross Generation (MU)



	2019-20	2020-21	2021-22
RES	173.88	155.7	170.68
Hydro	1555.48	1793.7	1702.53
Thermal	23351.61	26665.29	32673.43

Thermal Hydro RES

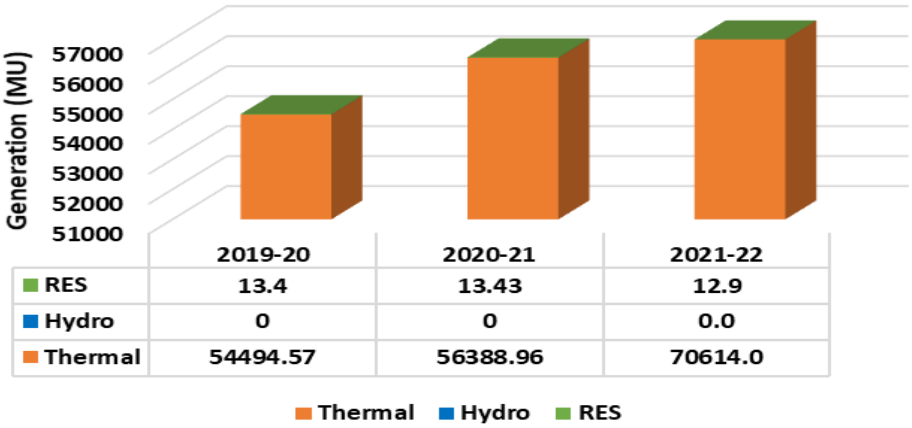
CESC (incl. HEL): Gross Generation (MU)



	2019-20	2020-21	2021-22
RES	0	0	0
Hydro	0	0	0
Thermal	10567.51	9737.5	10001.7

Thermal Hydro RES

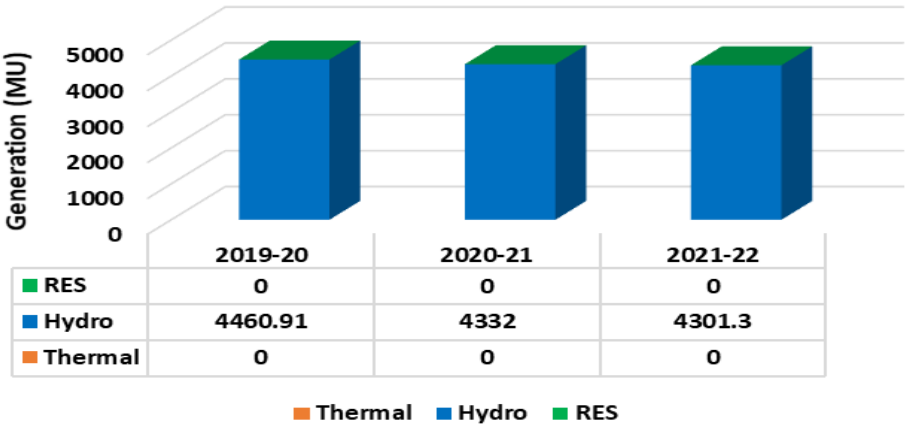
NTPC : Gross Generation (MU)



	2019-20	2020-21	2021-22
RES	13.4	13.43	12.9
Hydro	0	0	0.0
Thermal	54494.57	56388.96	70614.0

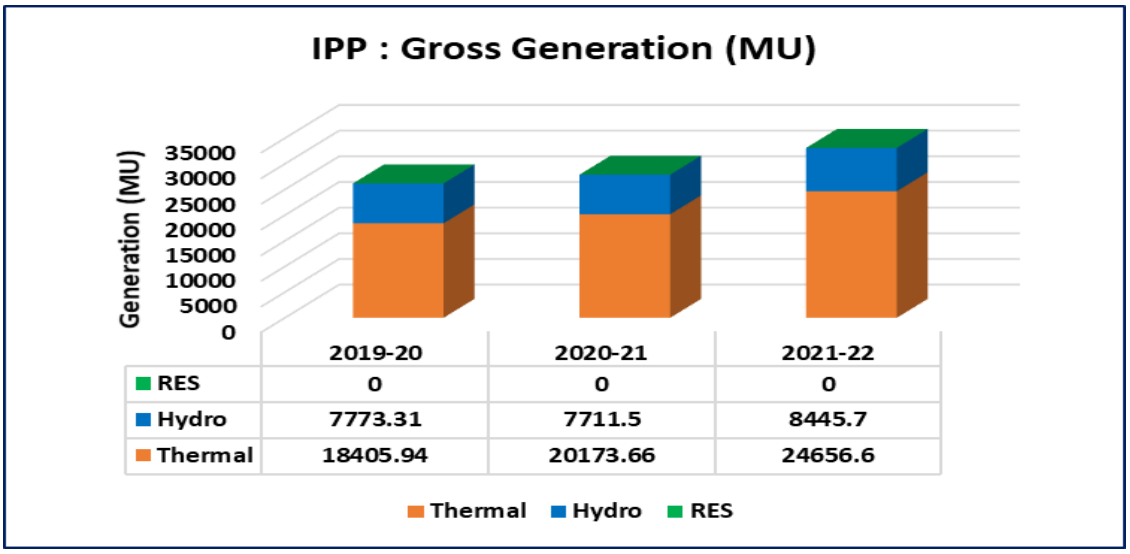
Thermal Hydro RES

NHPC : Gross Generation (MU)



	2019-20	2020-21	2021-22
RES	0	0	0
Hydro	4460.91	4332	4301.3
Thermal	0	0	0

Thermal Hydro RES



As against Compounded Annual Growth Rate (CAGR) of installed capacity of 4.7 %, the same of energy generation of the last 5 years is 6.8 % including energy import of 7939.4 MU from Bhutan. Maximum utilisation of available hydel power from Tala, Kurichhu, Chukha, Mangdechhu HEP of Bhutan was made by import through PTC and from Daghachu Hydel Power Station of Bhutan through TPTCL as nodal agency as per international agreement between Government of India and Royal Government of Bhutan.

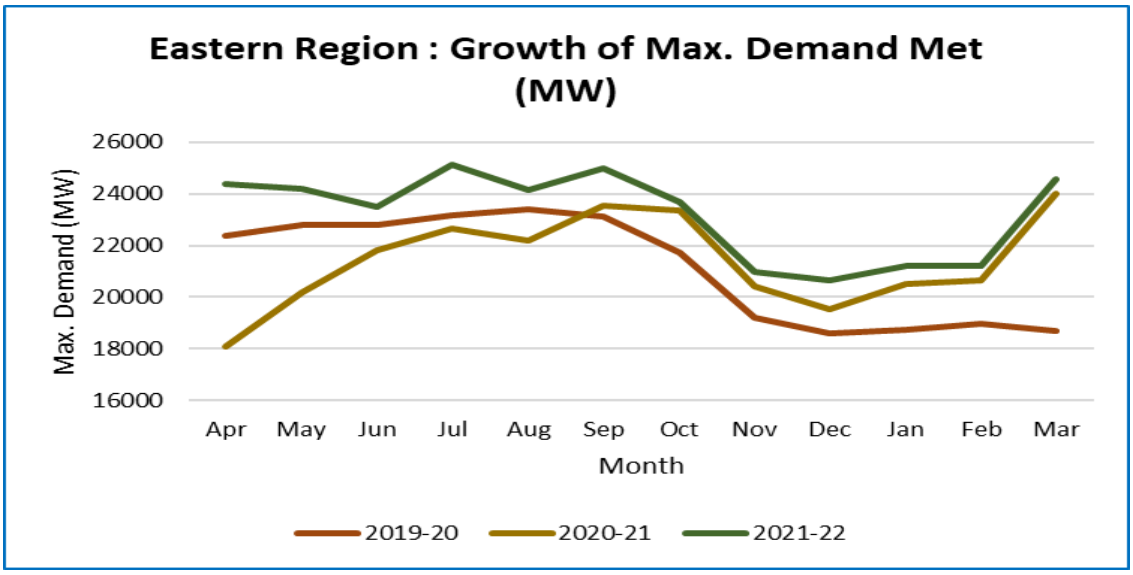
2.2.2 MAXIMUM DEMAND

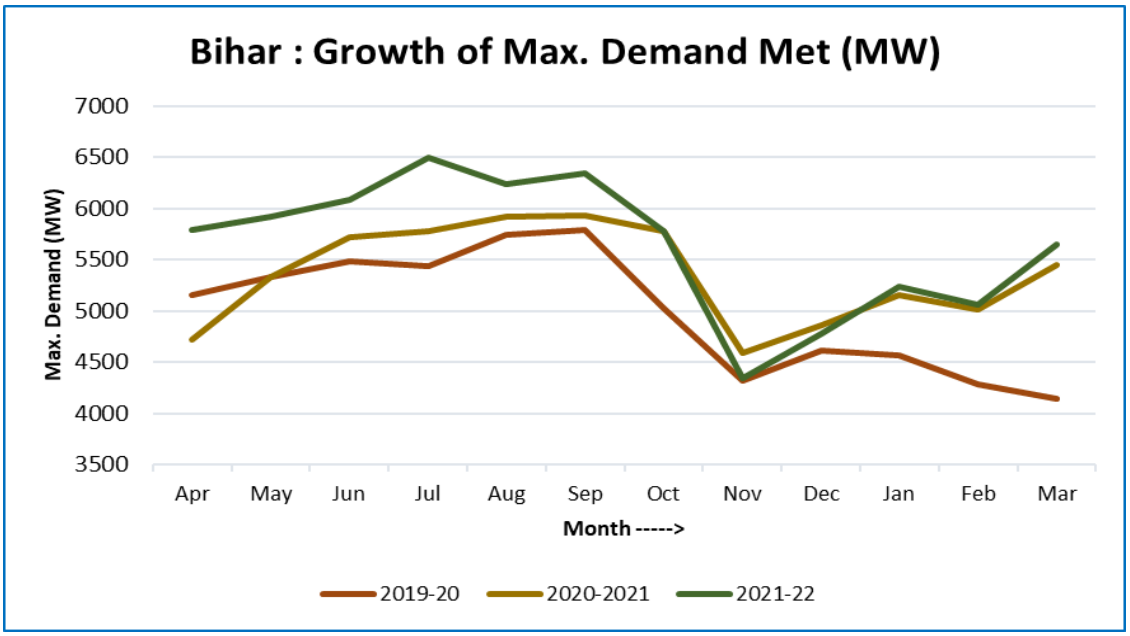
During the year 2021-22, the maximum coincident demand met in the Eastern Region was 25145 MW (net) compared to 24016 MW (net) during the preceding year. It was 1129 MW (4.7%) more than the maximum demand met of last year. Maximum demand met by the constituents during 2021-22 is given in Table below:

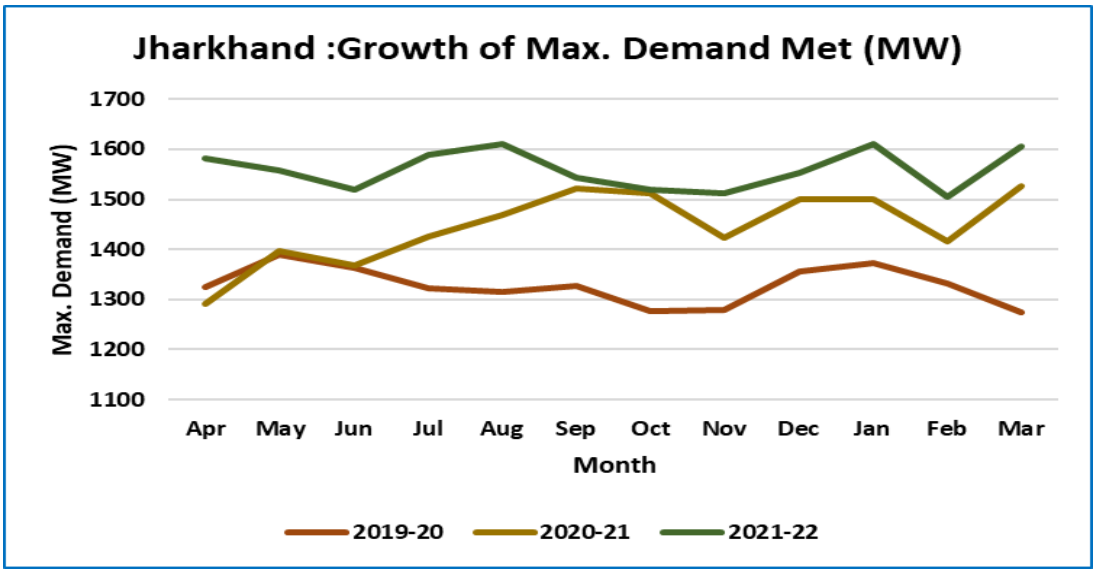
Table: Maximum Demand (in MW) of Constituents of Eastern Region

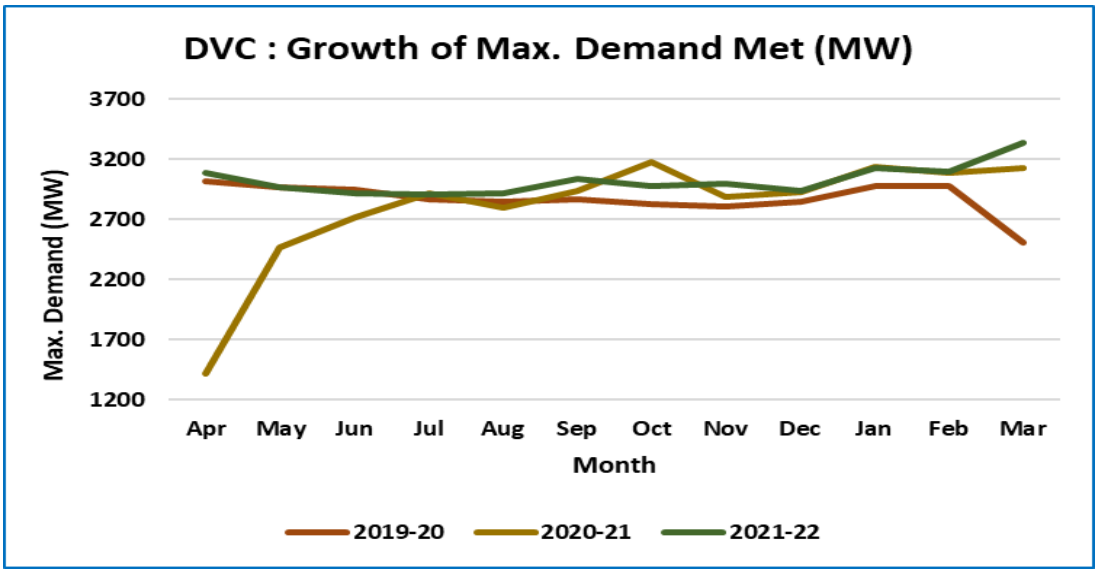
System	Max. Demand (MW)	System	Max. Demand (MW)
BSPHCL	6490	WBSEDCL	7417
JUVNL	1611	CESC	2006
DVC	3338	SIKKIM	133
GRIDCO	5643		
Max. Demand of Eastern Region: - 25145 MW			

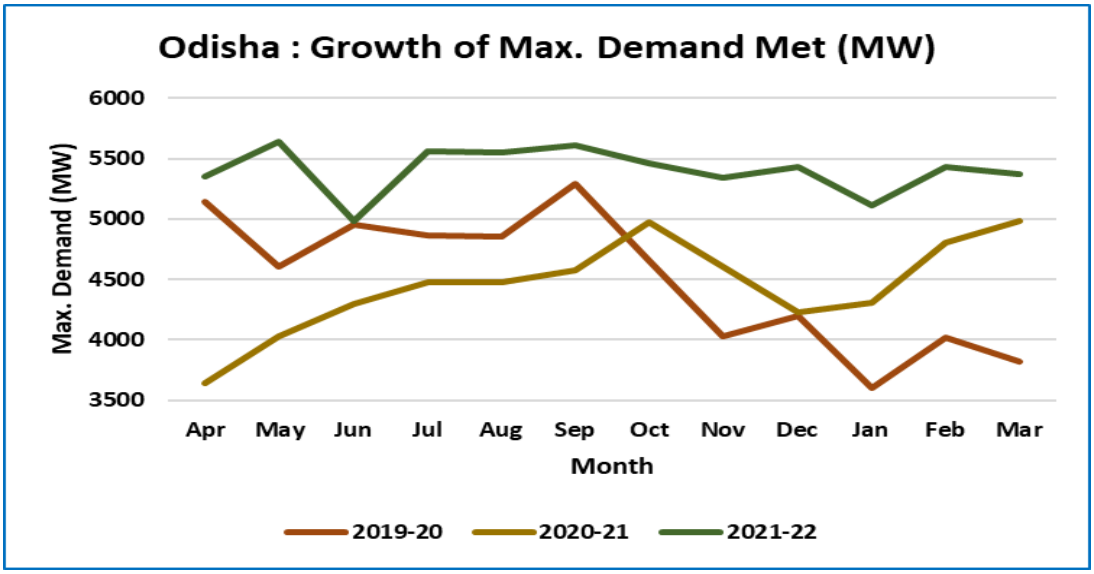
The growth in the maximum demand was somewhat restricted mainly bottlenecks in sub-transmission and distribution system of respective utility of E.R. The growth in Max. Demand Met (MW) in Eastern Region and its constituents for the last three years are shown below:

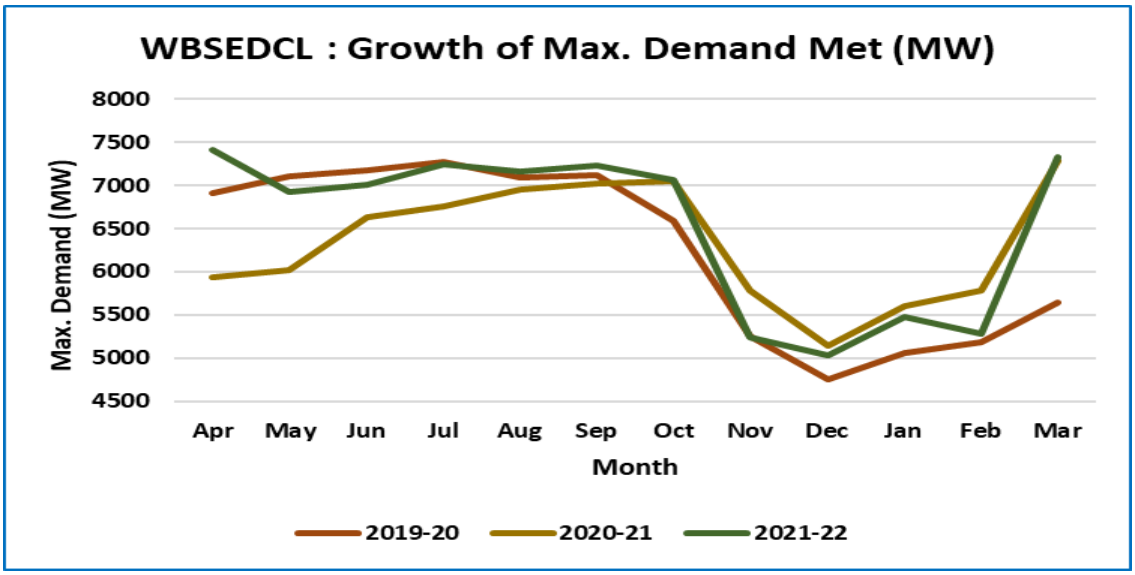

Eastern Region : Growth of Max. Demand Met (MW)
Max. Demand (MW)
26000
24000
22000
20000
18000
16000
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22

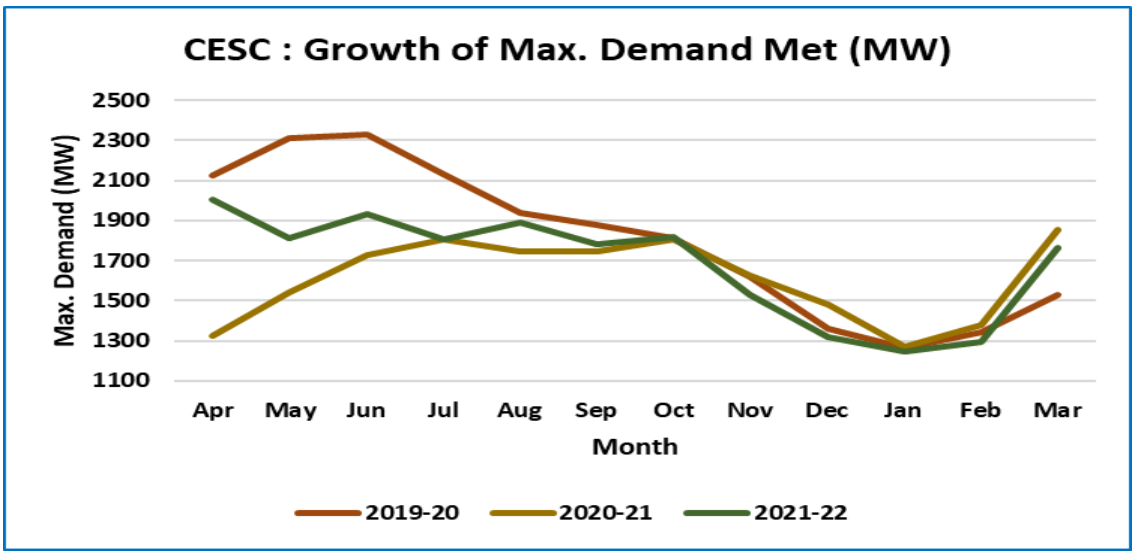

Bihar : Growth of Max. Demand Met (MW)
Max. Demand (MW)
7000
6500
6000
5500
5000
4500
4000
3500
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month ----->
2019-20
2020-2021
2021-22

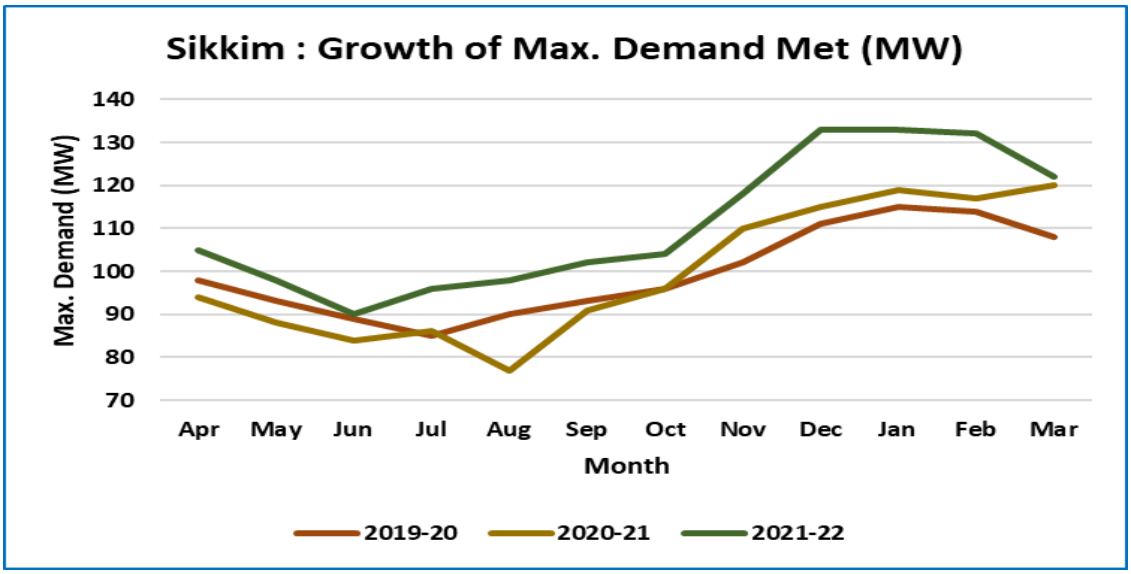

Jharkhand :Growth of Max. Demand Met (MW)
Max. Demand (MW)
1700
1600
1500
1400
1300
1200
1100
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


DVC : Growth of Max. Demand Met (MW)
Max. Demand (MW)
3700
3200
2700
2200
1700
1200
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


Odisha : Growth of Max. Demand Met (MW)
Max. Demand (MW)
6000
5500
5000
4500
4000
3500
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


WBSEDCL : Growth of Max. Demand Met (MW)
Max. Demand (MW)
8000
7500
7000
6500
6000
5500
5000
4500
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


CESC : Growth of Max. Demand Met (MW)
Max. Demand (MW)
2500
2300
2100
1900
1700
1500
1300
1100
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22

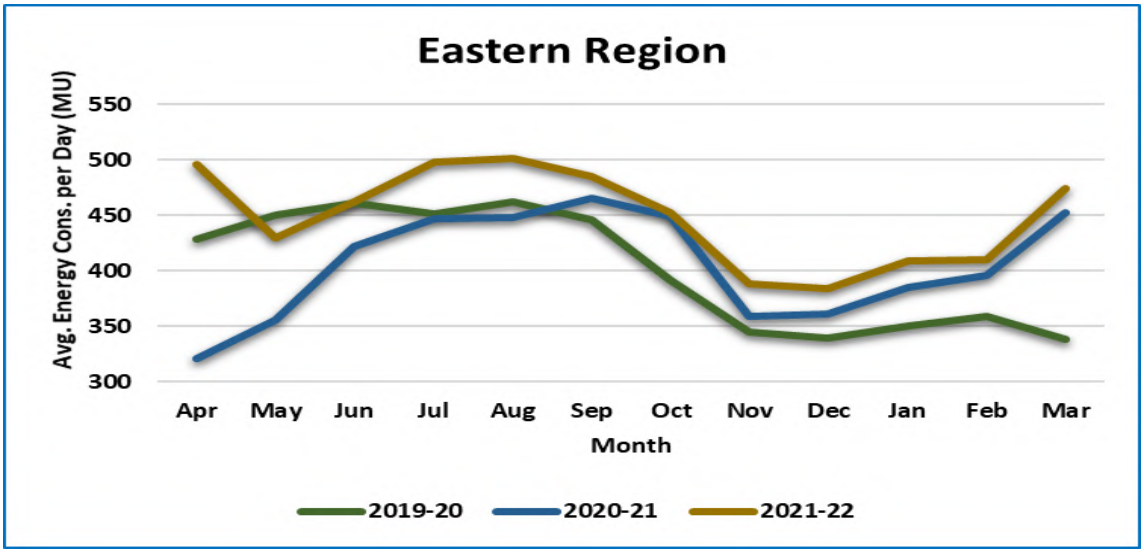

Sikkim : Growth of Max. Demand Met (MW)
Max. Demand (MW)
140
130
120
110
100
90
80
70
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22

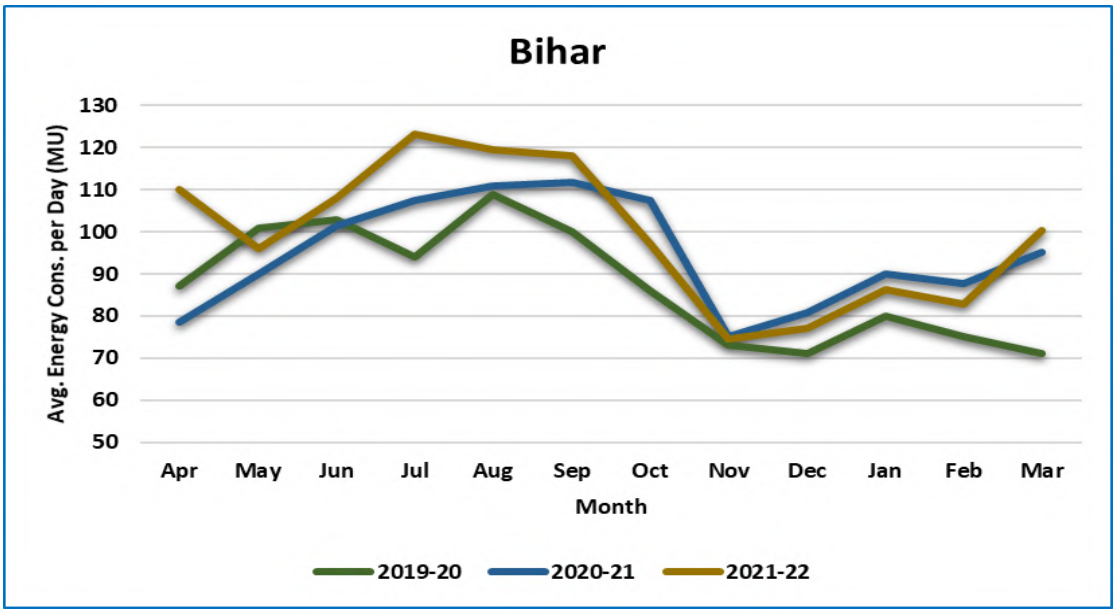
Compounded Annual Growth Rate (CAGR) of Peak Demand in ER for last five years was 5.15 %. Constituent-wise & month-wise peak demand met (MW) are shown in **Annexure-VI (A) & Annexure-VI(B)**.

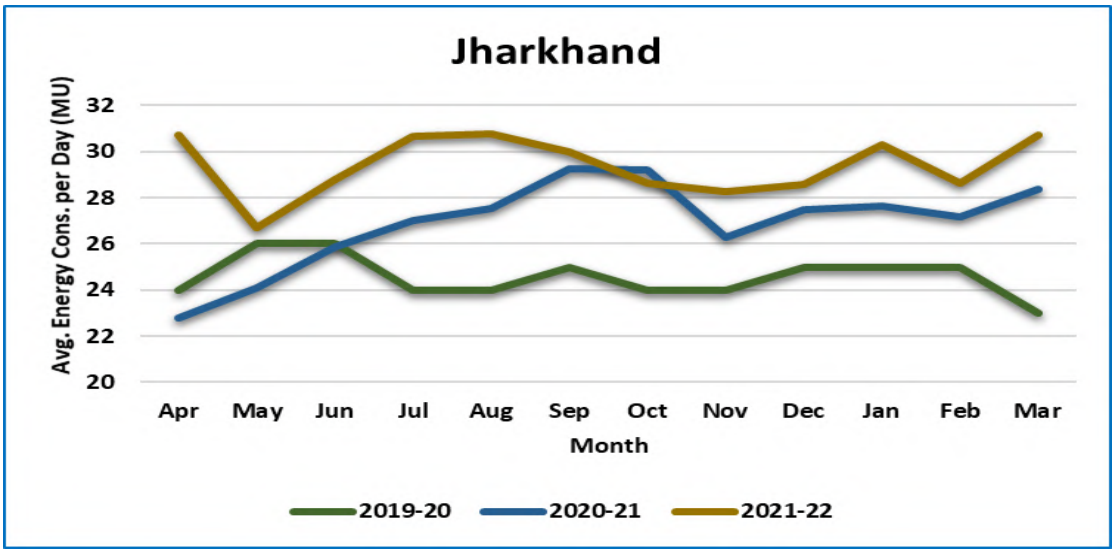
2.2.3 ENERGY CONSUMPTION

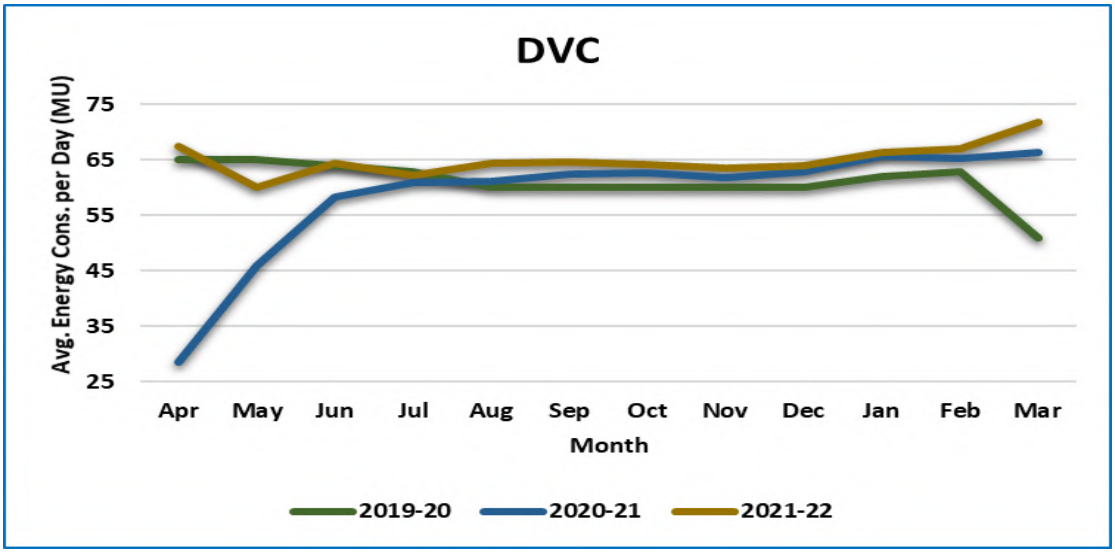
During the year 2021-22, the total energy consumption (net) in Eastern Region was 1,64,146 MU (including withdrawal by HVDC Sasaram & Alipurduar) compared to consumption of 1,48,022 MU during previous year i.e. 16,124 MU (10.88 %) more than last year's consumption. The daily average energy consumption in the region was about 450 MU/day compared to about 405.5 MU/day during the previous year. These figures exclude consumption of different industries from their respective captive power plants.

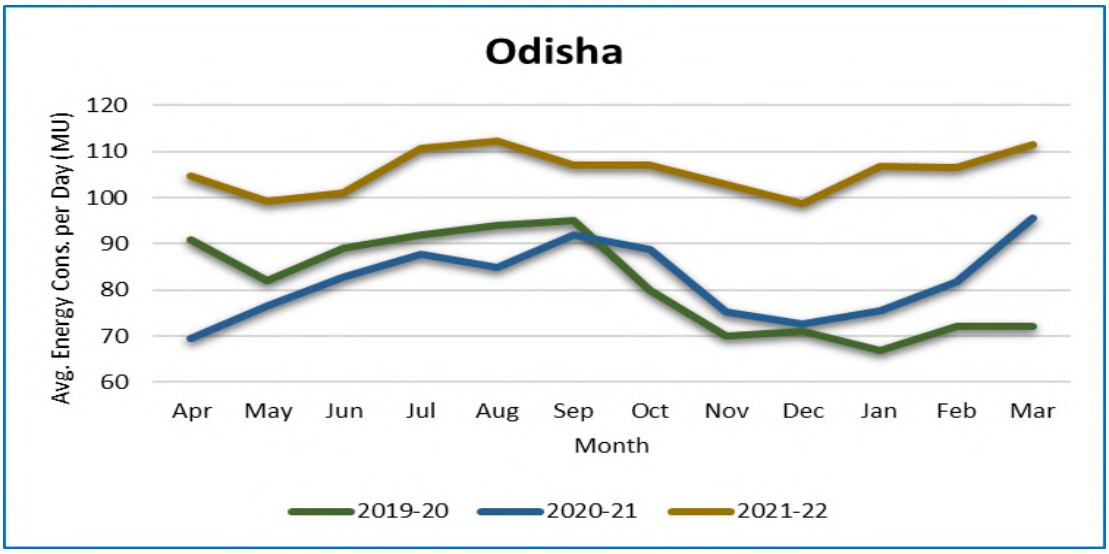
Compounded Annual Growth Rate (CAGR) of energy consumption of the last five years works out as 4.4 % as compared to the growth of peak demand figure of 5.15 %. Constituent-wise & month-wise energy consumption has been shown in **Annexure-VII(A) & Annexure-VII(B).** The growth in energy consumption in Eastern Region and its constituents for the last three years are shown below:

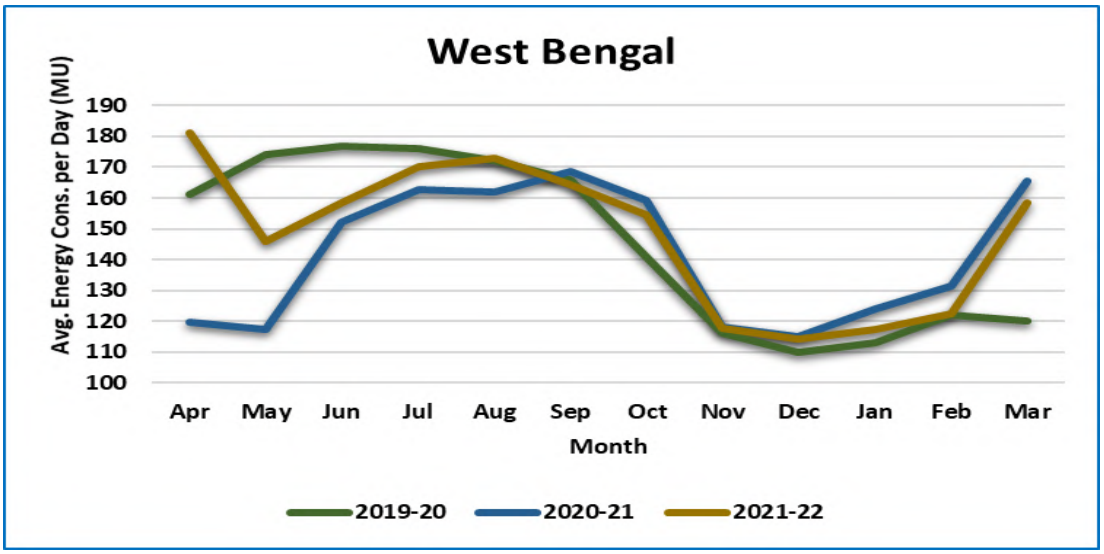


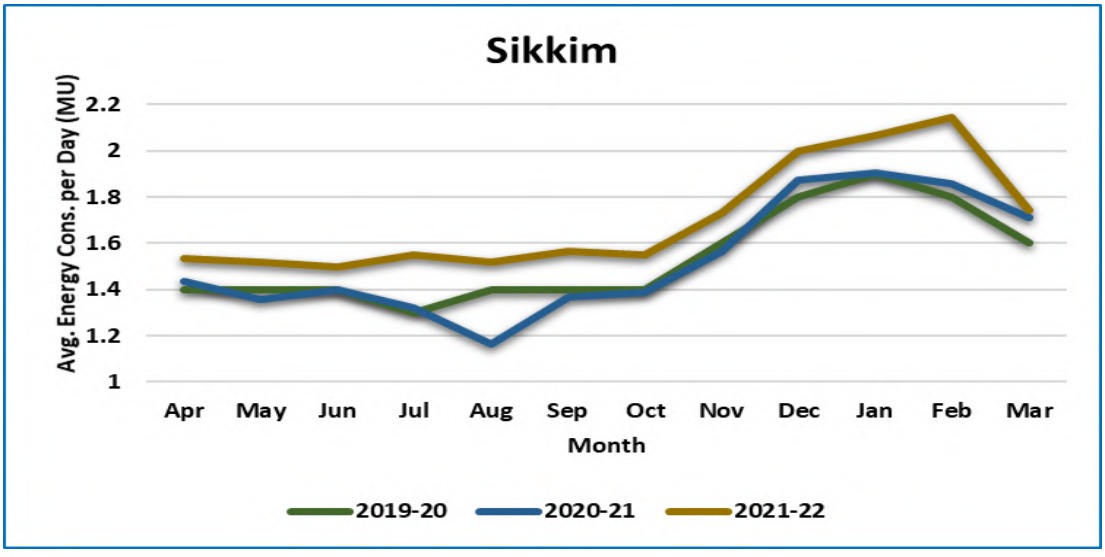

Bihar
Avg. Energy Cons. per Day (MU)
130
120
110
100
90
80
70
60
50
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


Jharkhand
Avg. Energy Cons. per Day (MU)
32
30
28
26
24
22
20
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


DVC
Avg. Energy Cons. per Day (MU)
75
65
55
45
35
25
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


Odisha
Avg. Energy Cons. per Day (MU)
120
110
100
90
80
70
60
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


West Bengal
Avg. Energy Cons. per Day (MU)
190
180
170
160
150
140
130
120
110
100
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22


Sikkim
Avg. Energy Cons. per Day (MU)
2.2
2
1.8
1.6
1.4
1.2
1
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2019-20
2020-21
2021-22

2.2.4 EXPORT TO OUTSIDE REGION

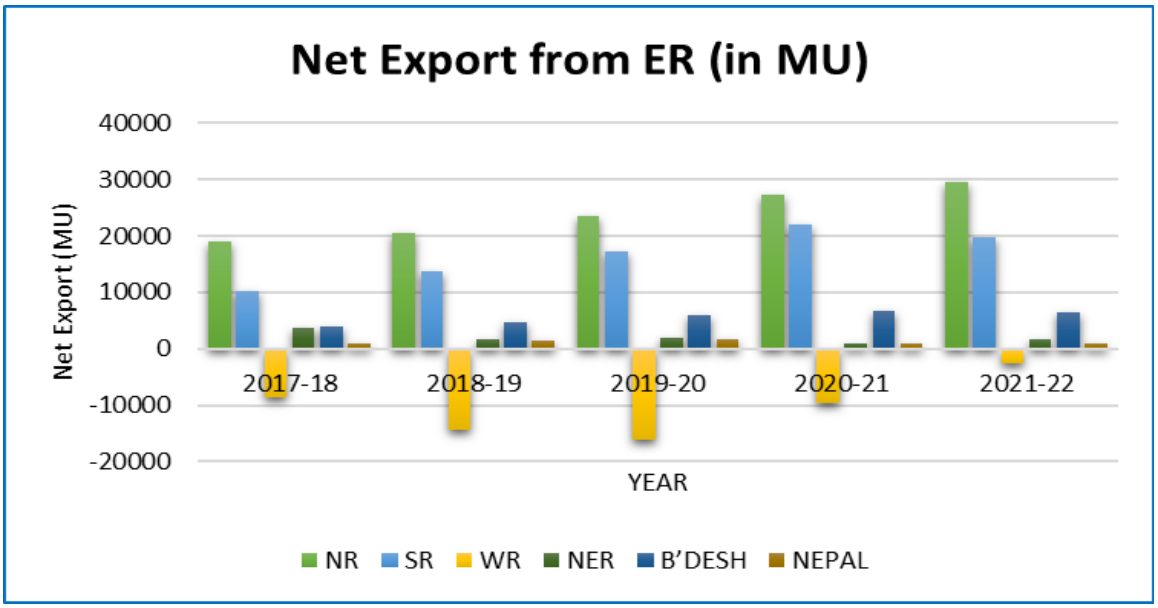
During the year 2021-22, the total net export of energy outside the region was 55963.7 MU compared to 48,235 MU in the last year (i.e. 7,728.7.4 MU or 16% more than the last year). Increase in export is due to increase of energy generation of Eastern Region. As per decision of the MoP, GoI, the power export to Bangladesh has been undertaken and regular supply has been commenced from October'2013 through 400 kV D/C Berhampur – Bheramara line with HVDC (B-t-B 2x500MW) station at Bheramara (Bangladesh). Also, power flow from ER grid to Nepal has been started from February'2016 through 400 kV (charged at 220 kV) Mazaffarpur - Dhalkheber (Nepal) line. The details regarding export of net energy from ER Grid including transmission loss are shown in table below:

Table: Net Energy Export (in MU) From Eastern Grid

Year	NR	SR	WR	NER	B'Desh	Nepal	Net Export	Growth
2017-18	19054	10247	-8666	3753	3964	945	29297	-8.3%
2018-19	20491	13783	-14311	1685	4808	1340	27796	-5.1%
2019-20	23613.2	17122.2	-16194	1816.38	6046.8	1571.71	33976.24	22.2%
2020-21	27179	22068.5	-9664.4	893.5	6680.0	1025.6	48182*	41.8%
2021-22	29558.9	19782.5	-2468.2	1565	6478	1047	55963.7$	16%

*excluding 53 MU drawal by Kuruchhu HEP of Bhutan
$ Excluding 228.7 MU drawal by HEPs of Bhutan

Growth of net export of Energy (MU) outside Eastern Region during last five years is given below:



2.2.4 VOLTAGE

During the year 2021-22, the voltage profile except a few important 400 kV sub–stations and 220 kV sub-stations remained satisfactory. Maximum & Minimum Voltage touched during 2021-22 at some of the important 765 kV & 400 kV sub-stations are shown below:

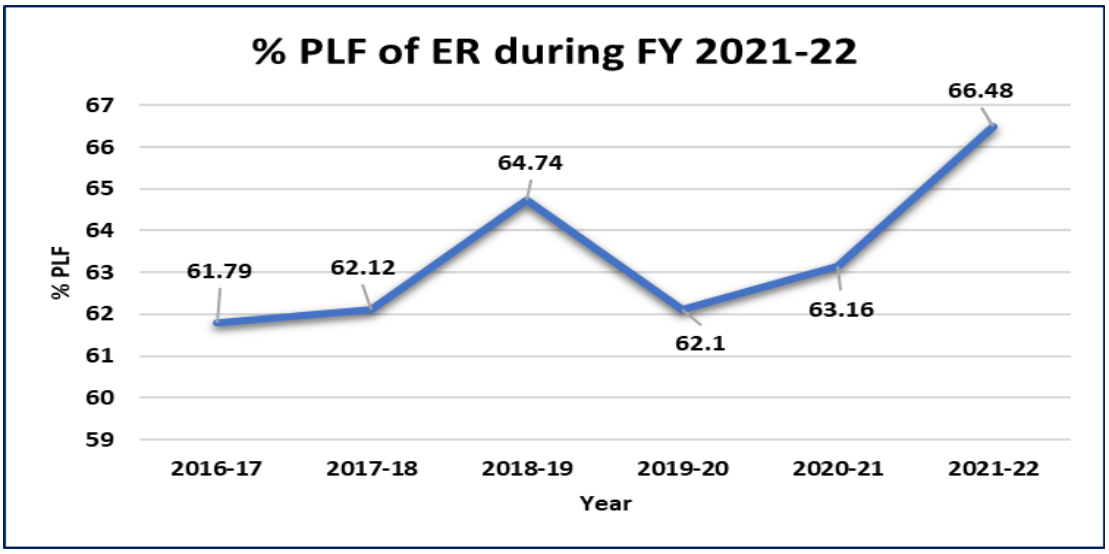
Sub-Station	Max. Voltage (kV)	Min. Voltage (kV)
New Ranchi 765 kV	803	752
Binaguri	426	390
Subhasgram	421	381
Jeerat	422	387
Biharshariff	424	388
Muzaffarpur	421	382
Jamshedpur	429	370
Rourkela	414	390
Jeypore	426	40
Maithon	417	396
Meramundali	428	389
Sasaram	419	378

2.3 PLANT LOAD FACTOR (PLF)

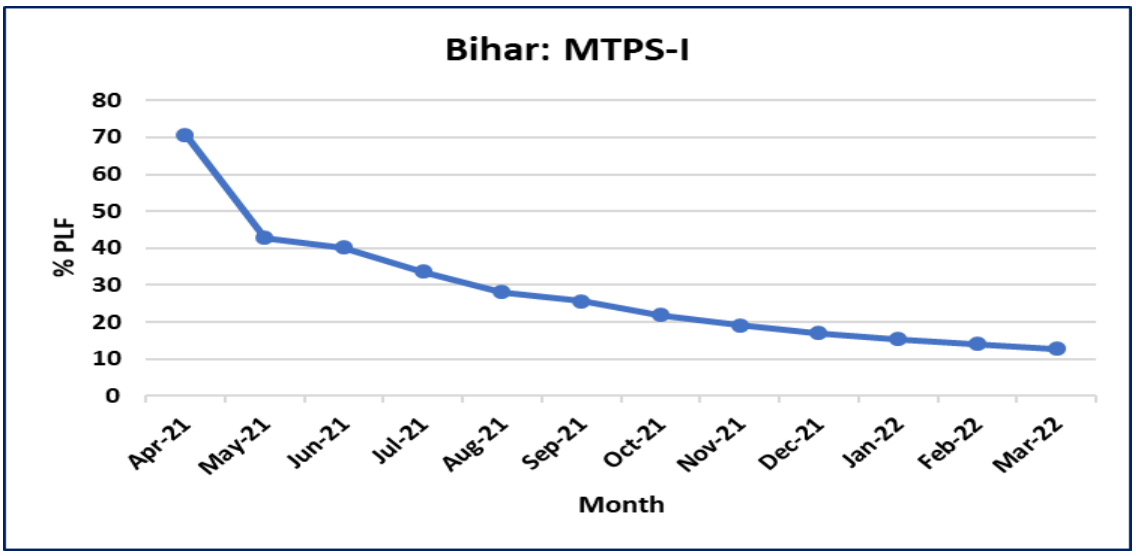
The average annual Plant Load Factor (PLF) of the thermal power stations in the Eastern Region for the year 2021-22 was 66.48% against 63.16% for 2020-21. The PLF has been calculated based on the capacity and generation of the commercially declared units only. Infirm generation and their injection period have not been considered for PLF calculations. Details of PLF have been shown at **Annexure-X.**

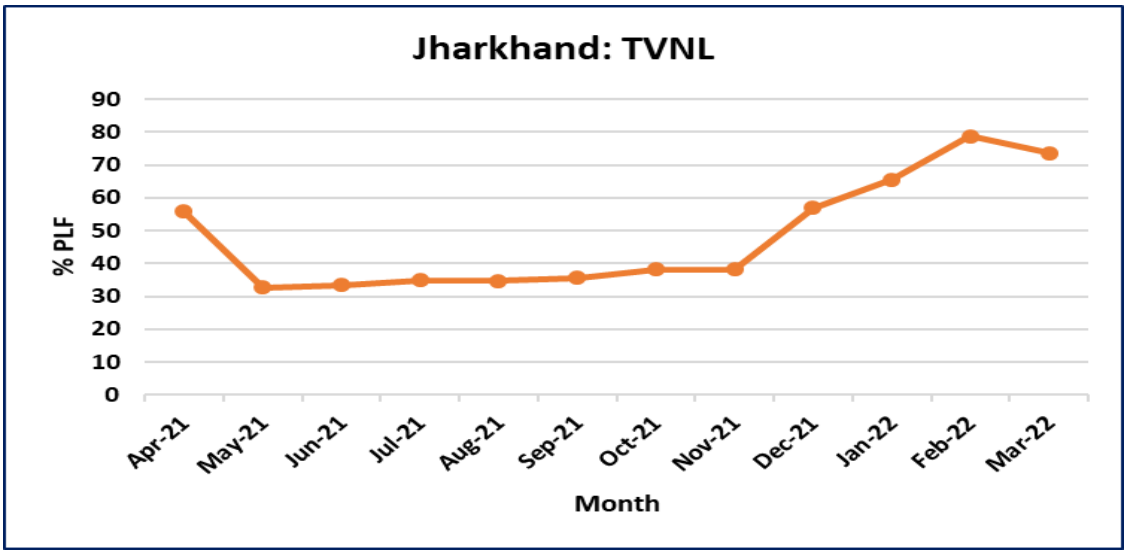
The average PLF of ER for the last six years is shown below: -

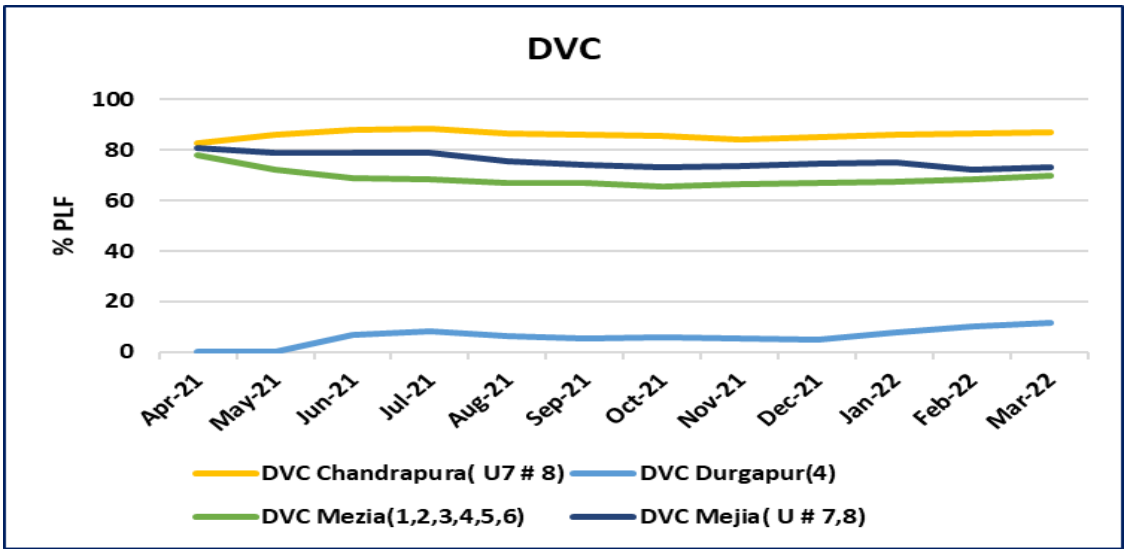
YEAR	Avg. PLF (in %)
2016-17	61.79
2017-18	62.12
2018-19	64.74
2019-20	62.10
2020-21	63.16
2021-22	66.48

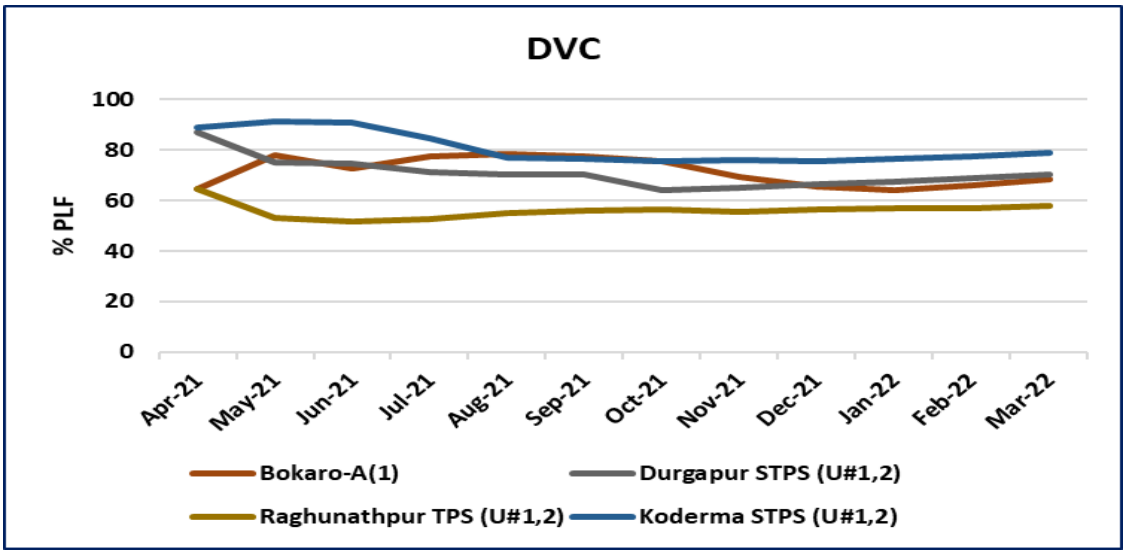


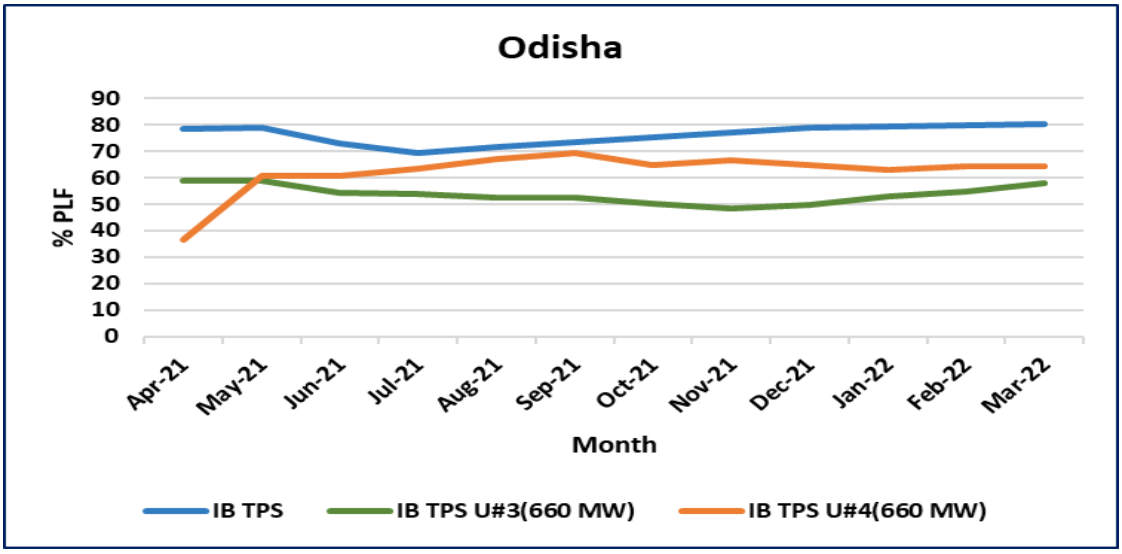
Constituent-wise & Plant-wise average thermal PLF is shown below:

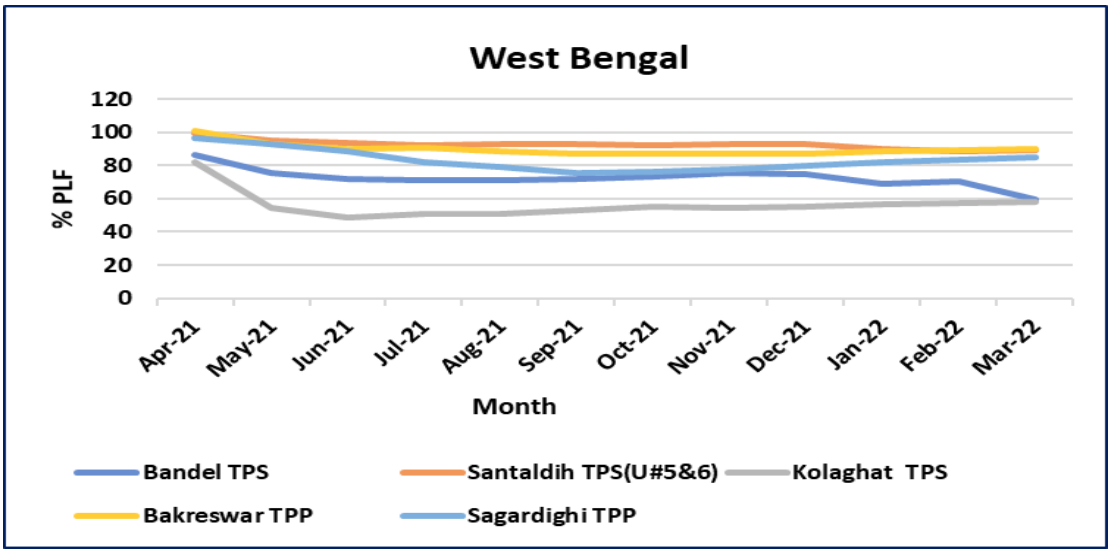


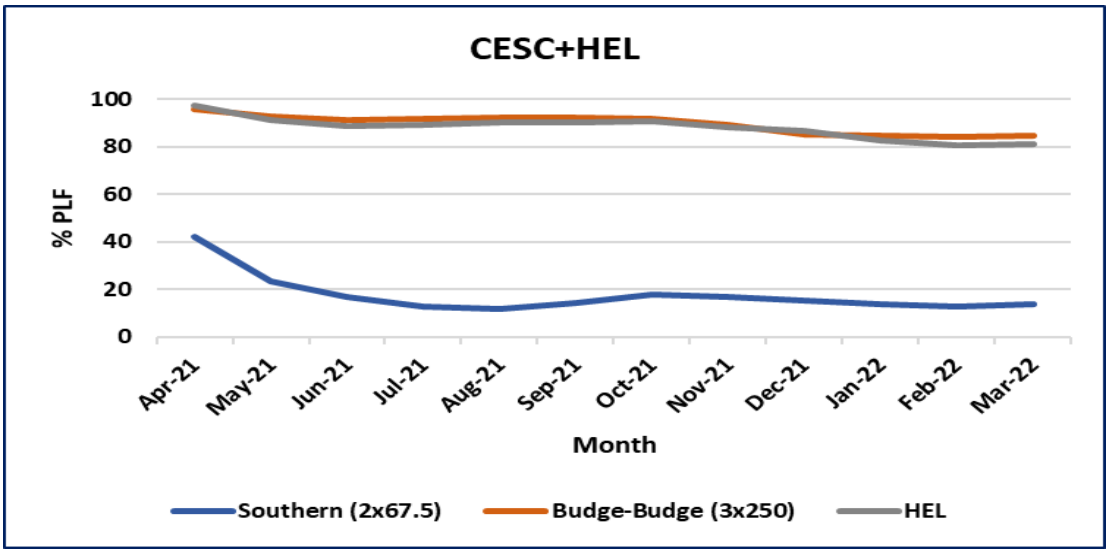


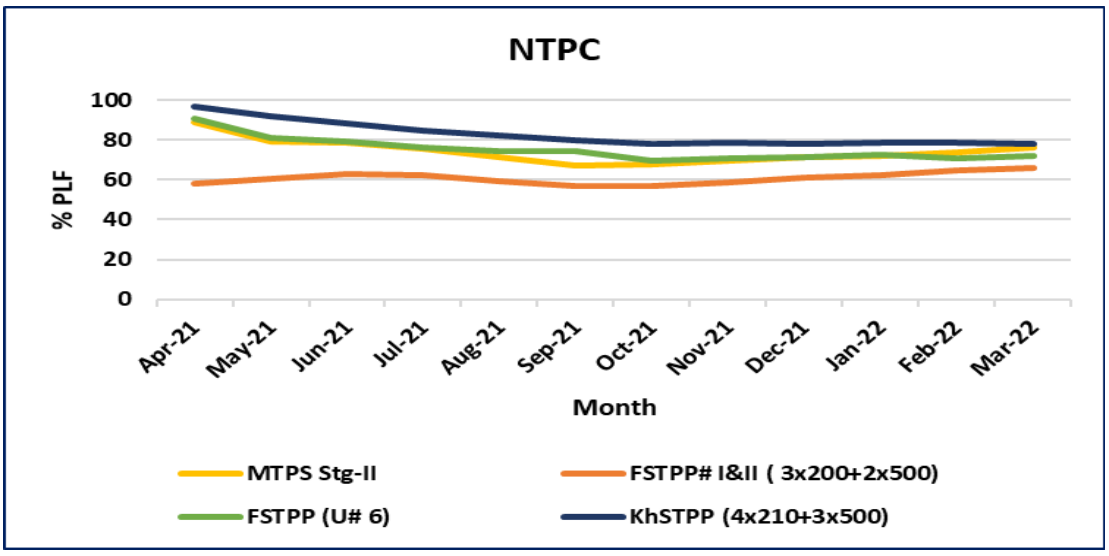

DVC
100
80
60
40
20
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
DVC Chandrapura(U7 # 8)
DVC Durgapur(4)
DVC Mezia(1,2,3,4,5,6)
DVC Mejia(U # 7,8)

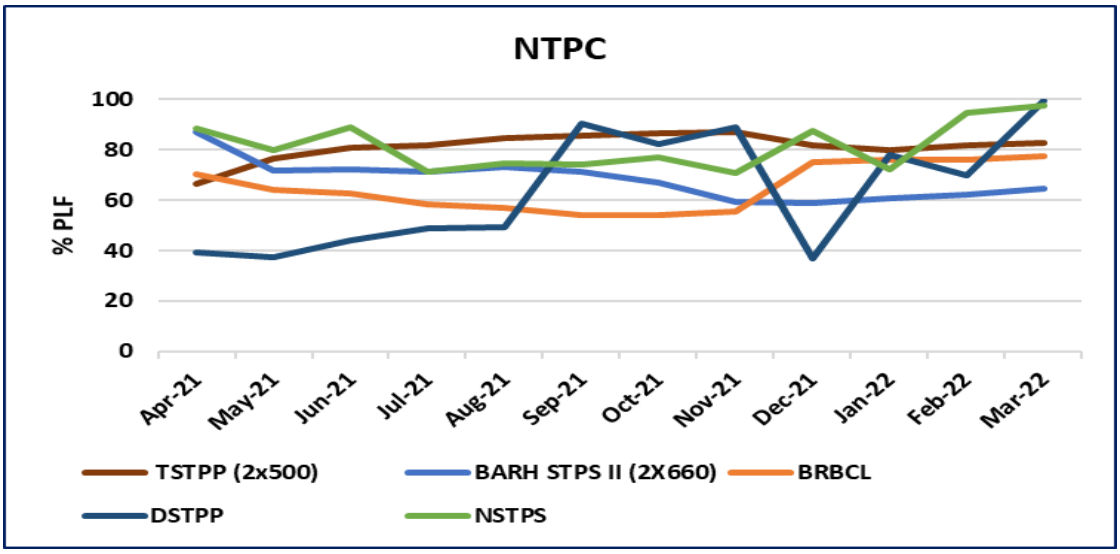

DVC
100
80
60
40
20
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Bokaro-A(1)
Durgapur STPS (U#1,2)
Raghunathpur TPS (U#1,2)
Koderma STPS (U#1,2)

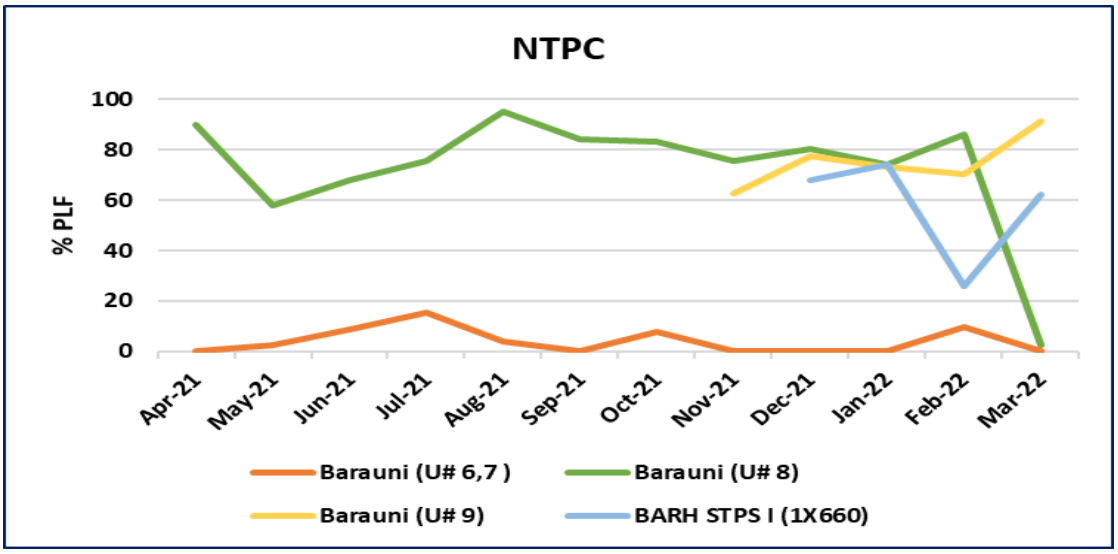

Odisha
90
80
70
60
50
40
30
20
10
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Month
IB TPS
IB TPS U#3(660 MW)
IB TPS U#4(660 MW)

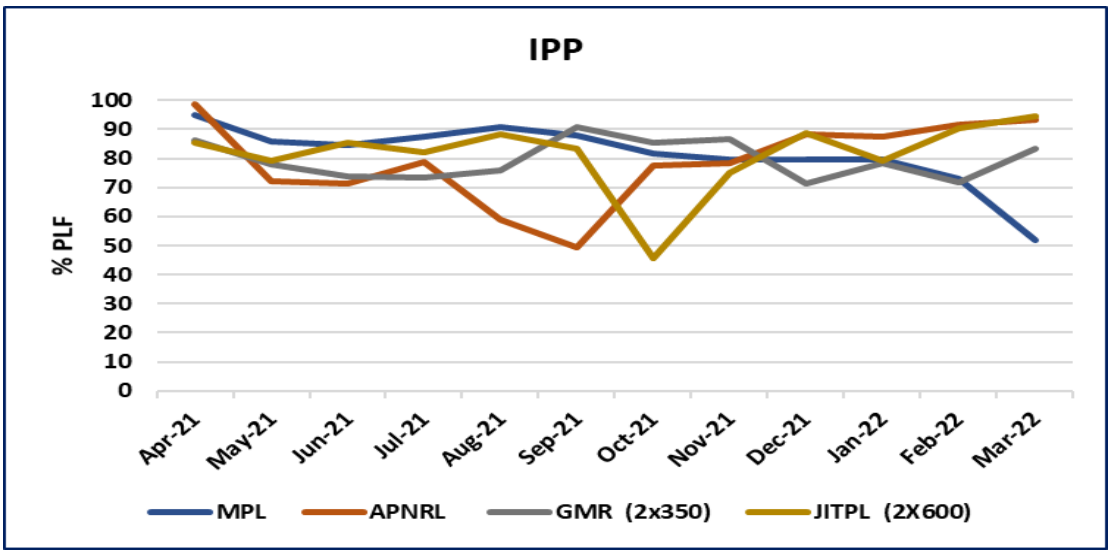

West Bengal
120
100
80
60
40
20
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Month
Bandel TPS
Santaldih TPS(U#5&6)
Kolaghat TPS
Bakreswar TPP
Sagardighi TPP


CESC+HEL
100
80
60
40
20
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Month
Southern (2x67.5)
Budge-Budge (3x250)
HEL


NTPC
100
80
60
40
20
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Month
MTPS Stg-II
FSTPP# I&II (3x200+2x500)
FSTPP (U# 6)
KhSTPP (4x210+3x500)


NTPC
100
80
60
40
20
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
TSTPP (2x500)
BARH STPS II (2X660)
BRBCL
DSTPP
NSTPS


NTPC
100
80
60
40
20
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Barauni (U# 6,7)
Barauni (U# 8)
Barauni (U# 9)
BARH STPS I (1X660)


IPP
100
90
80
70
60
50
40
30
20
10
0
% PLF
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
MPL
APNRL
GMR (2x350)
JITPL (2X600)

2.4 SYSTEM LOAD FACTOR

The Annual Load Factor of the Eastern Region during 2021-22 was 74.5% compared to 70.36% in the preceding year. The load factor was highest in DVC areas (81.2%) due to mostly industrial flat load and it was lowest in Sikkim (53%) mainly due to domestic & commercial load.

2.5 INTERNATIONAL EXCHANGE

Eastern Region has a unique geographical advantage of having inter-Regional links with all the regions of the country along with international lines to neighbouring countries namely Nepal, Bhutan and Bangladesh. Eastern Region exchanges power to the other regions of the country. It imports power from Chukha, Kuruchhu, Tala, Daghachu and Mangdechhu HEPs of Bhutan and exports power to Nepal & Bangladesh. Power export to Bangladesh is through 400 kV D/C Berhampur (WB) – Bheramara (Bangladesh) line. Power export from ER grid to Nepal is through 400 kV (charged at 220 kV) Mazaffarpur - Dhalkheber (Nepal) line. In addition to this, Bihar state network also supplies power to Nepal which has been shown separately.

The table below depicts quantum of power import from Bhutan and exchange (Net) with Nepal & Bangladesh in last five years:

YEAR	Import from Bhutan (Chukha, Kuruchhu, Tala, Mangdechhu & Daghachhu) (in MU)	Net Export to Nepal (in MU)		Net Export to Bangladesh (in MU)
		Through Bihar State network by BSPHCL	Through CTU network by NVVN	
2016-17	5824.00	1197	666.0	3782.0
2017-18	5072.08	1362.87	944.74	3964.3
2018-19	4395.87	1335.62	1340.43	4808.11
2019-20	6350.63	599.84	1571.71	6046.81
2020-21	9251.7	592.65	1025.6	6680
2021-22	7939.4	614.51	1047.4	6478

Excluding 228.7 MU export to HEPs of Bhutan.

Though all the international lines are not operational all the times however, details of existing lines are indicated below:

1. **Between ER – NEPAL**

   (a) **Through Bihar System**

   132 kV Balmiknagar (Bihar) - Surajpura (Nepal)
   132 kV Kataiya (Bihar) - Duhabi (Nepal)
   132 KV D/C Kataiya – Kusaha
   132 kV Raxual-Parwanipur line
   33 kV Thakurganj (Bihar) - Bhadarpur (Nepal)
   33 kV Raxaul (Bihar) - Birganj (Nepal)
   33 kV Kataiya (Bihar) - Biratnagar (Nepal)

33 kV Jaynagr (Bihar) - Siraha (Nepal)
33 kV Kataiya (Bihar) - Rajbiraj (Nepal)
33 kV Sitamari (Bihar) - Jaleswar (Nepal)
11 kV Jogbani (Bihar) - Biratnagari (Nepal)
11 kV Bargania (Bihar) - Gaur (Nepal)

(b) **Through CTU System**

400 kV (charged at 220 kV) Mazaffarpur-Dhalkheber (Nepal)

2. Between ER – BHUTAN

400 kV Binaguri (PGCIL) - Tala-I (Bhutan)
400 kV Binaguri (PGCIL) -Tala- II (Bhutan)
400 kV Binaguri (PGCIL) -Tala- IV (Bhutan)
400 kV Binaguri (PGCIL) -Malbase-III (Bhutan)
400 Kv Alipurduar(PGCIL)- Jigmelling Ckt-I
400 Kv Alipurduar(PGCIL)- Jigmelling Ckt-II
220 kV Birpara (PGCIL) - Chukha - I (Bhutan)
220 kV Birpara (PGCIL) -Chukha - II (Bhutan)
220 kV Birpara (PGCIL) - Malbase (Bhutan)
11 kV Kalchini (WBSETCL) - Phuntsholing (Bhutan)
11 kV Jaldhaka (WBSETCL) -Sibsoo (Bhutan)
11 kV Banarhat (WBSETCL) - Samchi (Bhutan)

3. Between ER – BANGLADESH

400 kV D/C Berhampur (PGCIL) - Bheramara (Bangladesh)

4. Between NER - BHUTAN

Power is also exchanged between Bhutan and India through the following lines of NER, but the exchange of power is booked against/from ER only.

132 kV Salakati (Assam, PG) – Gelephu (Bhutan)
132 kV Rangia (AEGCL) – Deothang (Bhutan)
11 kV Bongaigaon (AEGCL) -Gaylegphug (Bhutan)
11 kV Tamalpur (AEGCL) -SamdrupJongkhar (Bhutan)
11 kV Dampuri (AEGCL) -Daifan (Bhutan)

2.6 SALIENT FEATURES OF HYDRO RESERVOIR

Salient data regarding FRL, MDDL and the water level reached on the last day of the month in respect of major hydro reservoirs are given in **Annexure - XI.**

2.7 POWER CUTS IN THE REGION

Power supply position in Eastern Region was by and large satisfactory except for sub-transmission and distribution constraints in some of the constituents and shortage in area served by SBPDCL, NBPDCL and JBVNL during peak hours.

2.8 GENERATING UNITS COMMISSIONED / DECOMMISSIONED DURING THE YEAR

New Generating units which have been declared their commercial operation and the units which have been retired during the year 2021-22 is given at **Annexure – IV B**.

2.9 PROGRESS OF CONSTRUCTION OF GENERATING UNITS & TRANSMISSION LINES

List of ongoing Power Projects / Generating Units and progress of construction of ongoing transmission lines are given at **Annexure – XXI and Annexure –XXII** respectively**.**

2.10 ALLOCATION OF POWER FROM CENTRAL GENERATING STATIONS.

Allocation of power from Central generating stations in Eastern Region during 2021-22 is given at **Annexure – XII.**

CHAPTER-3

GRID INCIDENTS / DISTURBANCES

3.1 INTRODUCTION:

As per the Central Electricity Authority (Grid Standards), 2010, "Grid Disturbance (GD)" means tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and static VAR compensator, resulting in total failure of supply at a sub-station or loss of integrity of the grid, at the level of transmission system at 200kV and above (132kV and above in the case of North-Eastern Region).

Based on the severity of tripping, grid disturbance has been categorised in increasing order of severity as follows:

1. **Category GD-I**: when less than 10% of the antecedent generation or load in a regional grid is lost;
2. **Category GD-2**: when 10% to less than 20% of the antecedent generation or load in a regional grid is lost;
3. **Category GD-3**: when 20% to less than 30% of the antecedent generation or load in a regional grid is lost;
4. **Category GD-4**: when 30% to less than 40% of the antecedent generation or load in a regional grid is lost;
5. **Category GD-5**: when 40% or more of the antecedent generation or load in a regional grid is lost;

"Grid Incidence (GI)" means tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and static VAR compensator, which requires re-scheduling of generation or load without total loss of supply at a sub-station or loss of integrity of the grid at 220 kV and above (132kV and above in the case of North-Eastern Region).

Similar to the Grid Disturbances, Grid Incident has also been categorised based on the severity of incidents, as follows:

1. **Category GI-1**: tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and static VAR compensator, which requires re-scheduling of generation or load, without total loss of supply at a sub-station or loss of integrity of the grid at 220 kV and above (132kV and above in the case of North-Eastern Region).

2. **Category GI-2**: tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and static VAR compensator, which requires re-scheduling of generation or load, without total loss of supply at a sub-station or loss of integrity of the grid at 400 kV and above (220kV and above in the case of North-Eastern Region).

3.2 GRID INCIDENTS/ GRID DISTURBANCES IN EASTERN REGION

Details of major grid disturbances and grid incidents occurred in Eastern region during the year 2021-22 are given at **Annexure-XIII** & **Annexure-XIV**, respectively.

A summary of the grid incidents and grid disturbances in Eastern Region during the year 2021-22 is given the table below:

Year	Total No. of Grid Disturbances	Category of Grid Disturbance					Total No. of Grid Incidents	Category of Grid Incidents	
		GD-1	GD-2	GD-3	GD-4	GD-5		GI-1	GI-2
2021-22	73	73	0	0	0	0	4	2	2

3.3 REMEDIAL ACTION

The grid disturbances and grid incidents were discussed in the Protection Coordination Sub-committee (PCC) meeting and Operation Coordination Sub-committee (OCC) held every month. The analysis of these incidents/disturbances was carried out and remedial measures were suggested. Implementation of suggested remedial measures was also being monitored in PCC and OCC meetings.

CHAPTER- 4

COMMERCIAL

4.1 REGIONAL ENERGY ACCOUNTING (REA)

CERC Regulations on Availability Based Tariff (ABT), applicable for accounting of Capacity charges and Energy charges of Central Sector Generating Stations; transmission charges of Central Sector Transmission Systems and transactions of interstate power through exchange and bilateral mechanisms, was implemented in Eastern Region (ER) w.e.f. 01.04.2003. CERC has issued "*CERC Tariff Regulations, 2019-24 (Terms and Conditions of Tariff)"* which has come into force on and from 01.04.2019. This regulation shall remain in force for a period of five years i.e. up to 31.03.2024 from the date of commencement unless reviewed earlier or extended by the Commission.

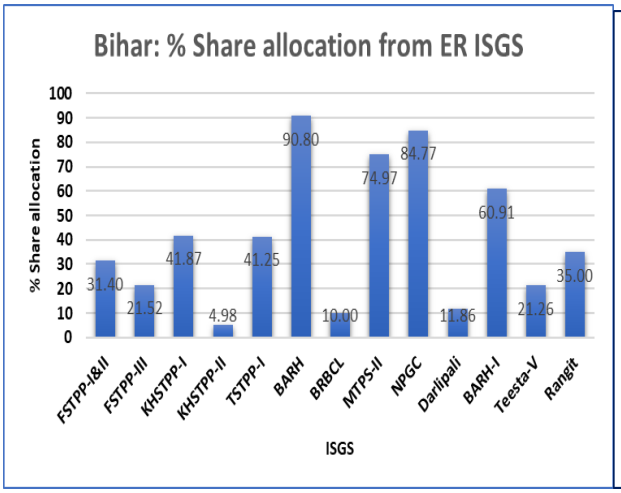
The following are the major components of Availability Based Tariff (ABT):

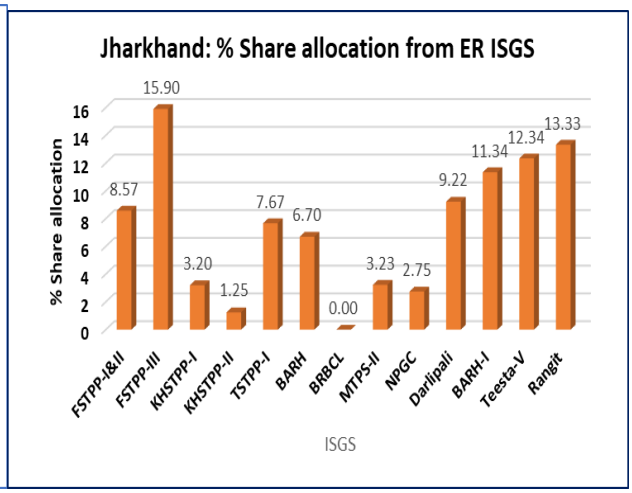
i) Capacity Charge inclusive of incentive (for recovery of Annual fixed cost)
ii) Energy Charge (for recovery of primary fuel cost)
iii) Transmission Charges (for recovery of annual fixed cost of transmission system)
iv) Deviation Settlement Mechanism, etc.

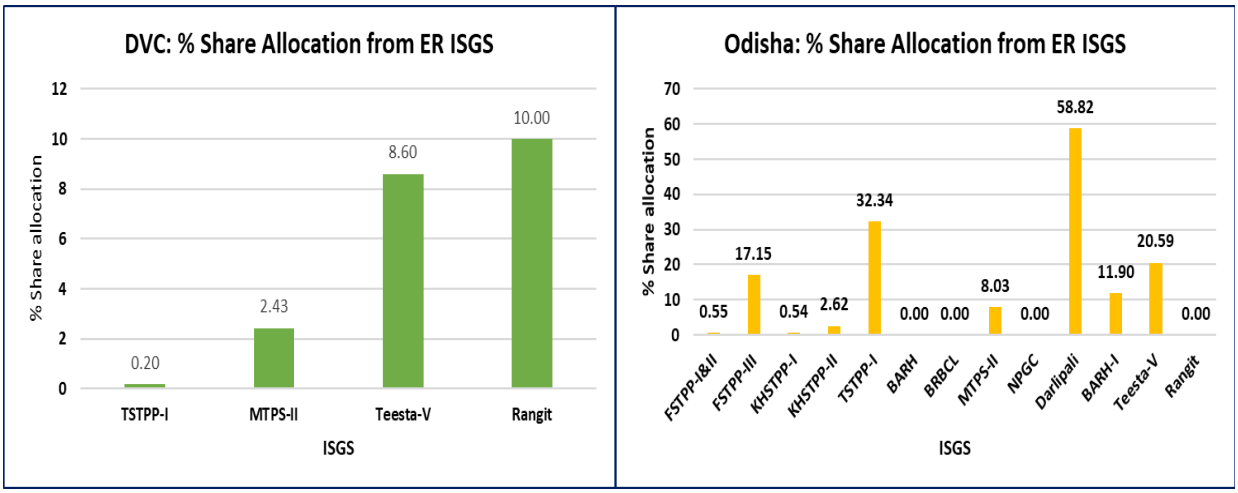
The regional energy accounts bring out the transactions/accounts for Central Generating Stations (CGSs), IPPs, LTOA, STOA, etc.

4.1.1 SHARE ALLOCATION OF ER STATES FROM CENTRAL GENERATING STATIONS

Regional Energy Accounting for central generating stations is based on the allocation orders from Ministry of Power /Central Electricity Authority. The percentage share of total capacity of each ISGS in Eastern Region is allocated to the beneficiaries of Eastern, Northern, Western, Southern and North Eastern Region, which is revised from time to time. Weighted average allocation of shares from each ISGS in Eastern Region during 2021-22 are given at **Annexure-XII.** The percentage share allocation of ER states from ER Central Generating Stations for F.Y 2021-22 has been shown below.







In case of Un-requisitioned surplus (URS) power, the statement of URS is being issued for adjustment of share allocation of the month based on the surrender/avail of URS power.

4.1.2 ACCOUNTING OF CENTRAL GENERATING STATIONS

Capacity Charges:

The capacity charge (inclusive of incentive) payable to a thermal or hydro generating station for a calendar month is ensured if availability of 85% or more is achieved in line with the prevailed tariff regulations.

For hydro generating stations the Annual Capacity charge is recoverable from the beneficiaries as per percentage share allocation of each beneficiary after adjustment of 12% free share of home state. The payment of capacity charge is independent of the energy drawn by the beneficiary and is dependent only on the Plant Availability Factor for the Month (PAFM). To minimize the cost of power procurement, the beneficiary has the option of lower drawl of energy (paying full capacity charge for its share) and to meet demand from other source such as bilateral exchange and through power exchanges such as IEX/PXIL.

Energy Charges:

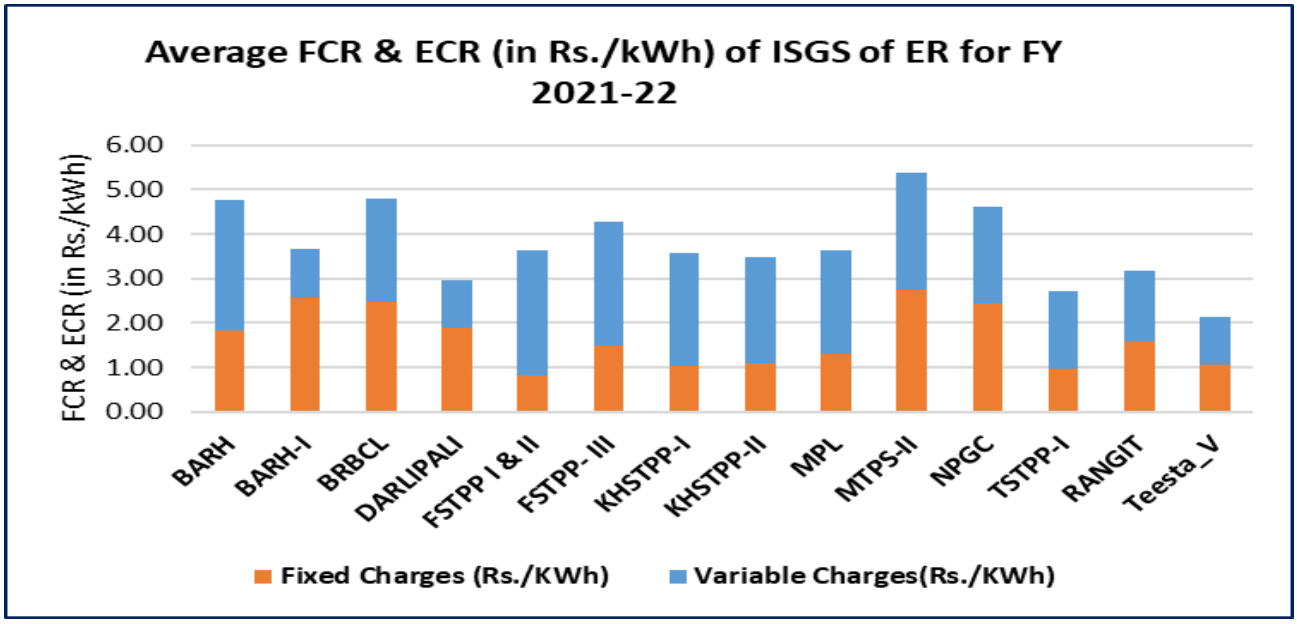
The Energy charges of the Central Generating Thermal Power Stations cover primary fuel cost and monthly fuel price adjustment (FPA). From July, 2011 onwards, the Fuel Price Adjustment has been included in the energy charges. The energy charges payable by every beneficiary for the total energy scheduled to be supplied to such beneficiaries during the month on ex-power plant basis. In case of Hydro Generating stations, the energy charge shall be payable by beneficiaries in proportional to their respective allocation in the saleable capacity of the generating station.

The indicative average energy rate for Central Sector Thermal stations in ER for the year 2021-22 were as under:

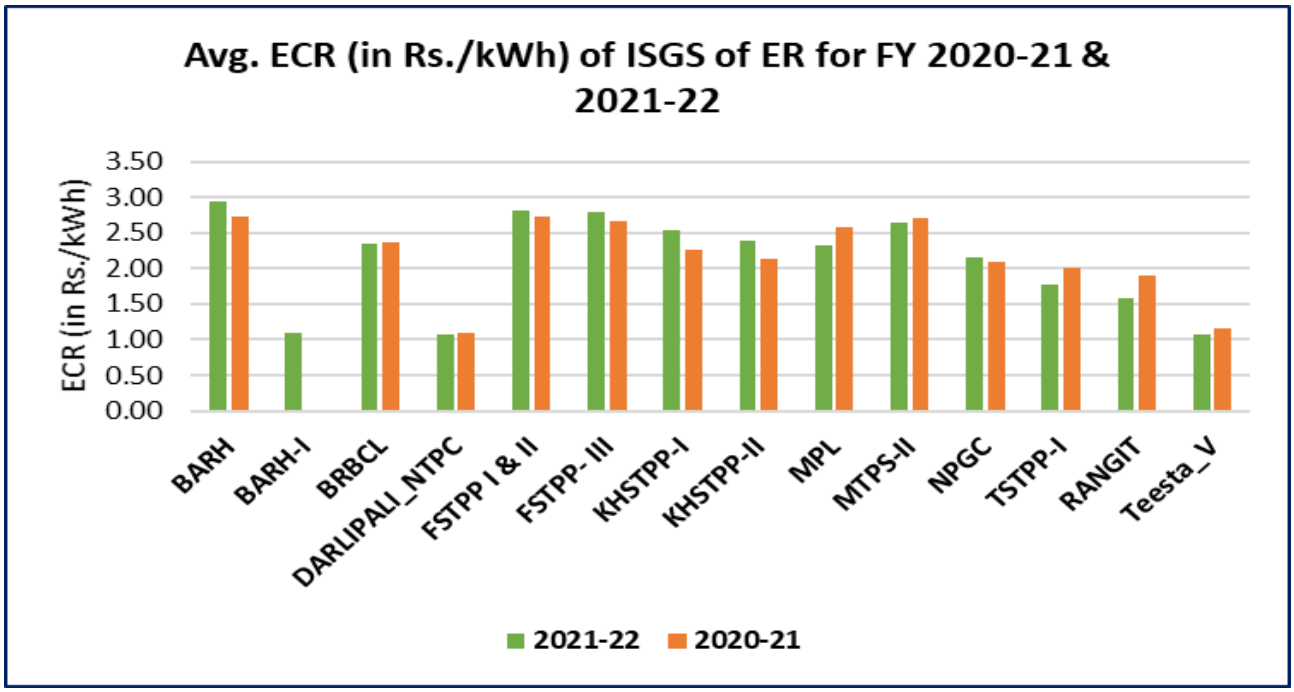
Average unit rate (₹ /kWh) during 2021-22:

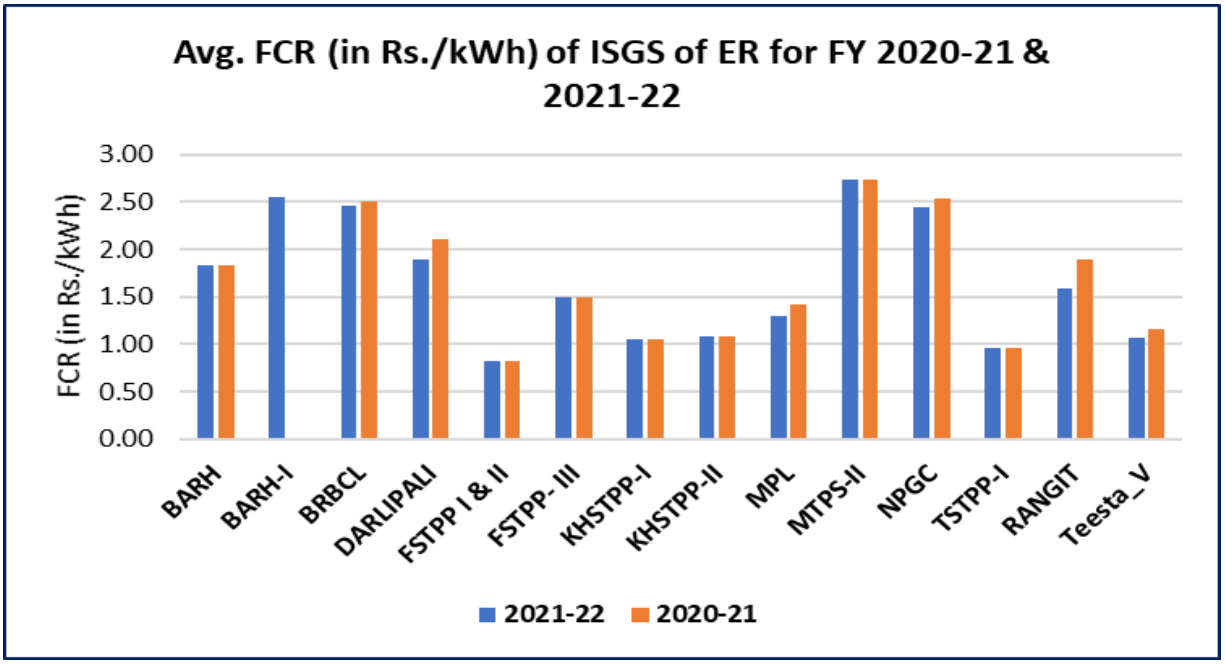
Generator (ISGS)	Average of FCR (Rs./kWh)	Average of ECR (Rs./kWh)	Average Unit rate (Rs./kWh)
BARH	1.84	2.94	4.78
BARH-I	2.56	1.09	3.65
BRBCL	2.46	2.35	4.80
DARLIPALI	1.89	1.08	2.97
FSTPP I & II	0.82	2.82	3.64
FSTPP- III	1.49	2.80	4.29
KHSTPP-I	1.05	2.53	3.58
KHSTPP-II	1.09	2.40	3.49
MPL	1.30	2.32	3.62
MTPS-II	2.73	2.65	5.39
NPGC	2.44	2.16	4.60
TSTPS-I	0.96	1.76	2.72
RANGIT	1.58	1.58	3.17
Teesta-V	1.07	1.07	2.13

ECR: Energy Charge Rate; FCR: Fixed Charge Rate.



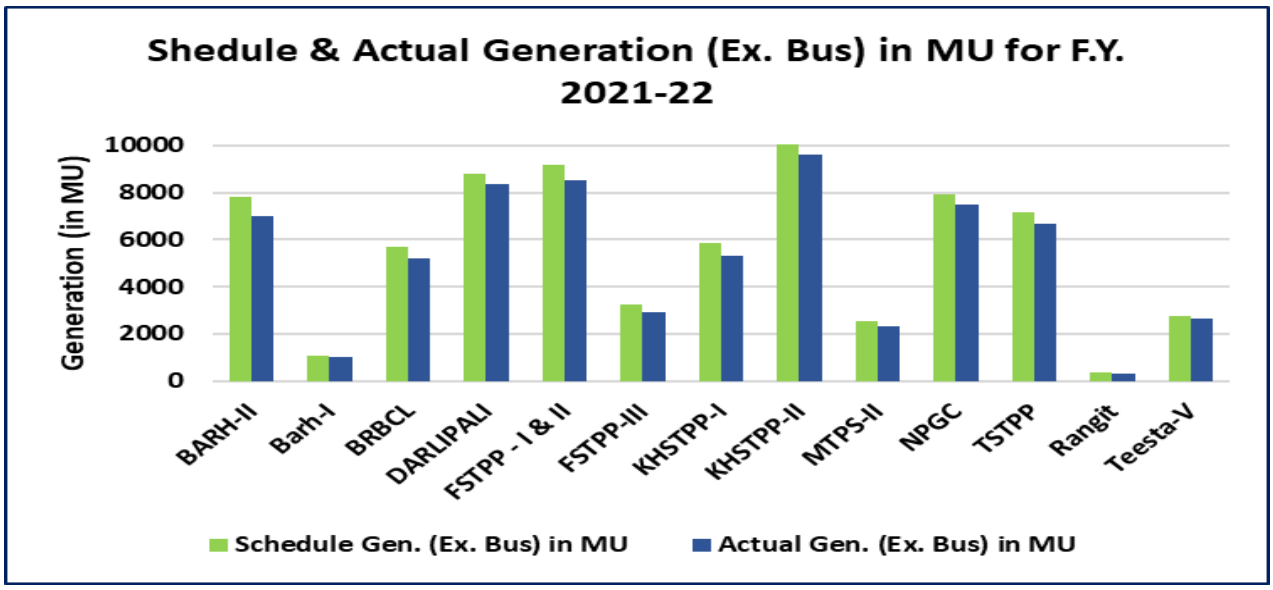
The year-wise variation in energy charge rate as well as fixed charge rate for ISGS of ER for the year 2020-21 & 2021-22 are given below for reference.





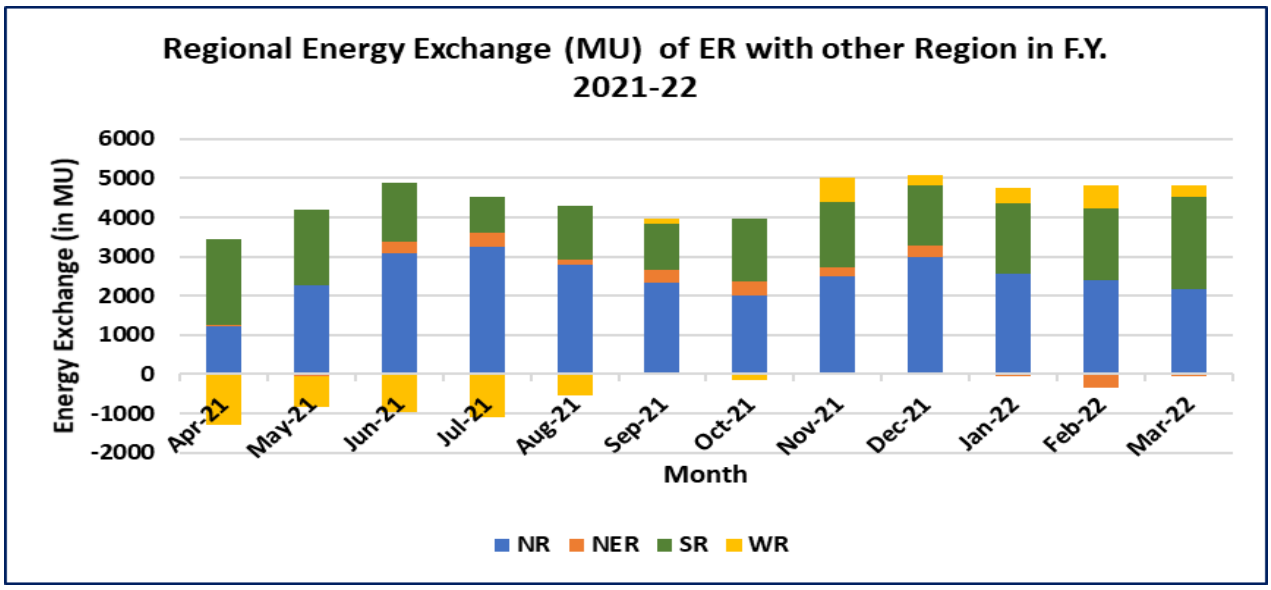
4.1.3 Annual Generation of NTPC and NHPC stations in ER during the year 2021-22:

Generating Station (ISGS)	Scheduled Generation (Ex-Bus) in MU	Actual Generation (Ex-Bus) in MU
Barh STPS-II	7837.131	6990.295
Barh STPS-I	1057.801	1264.526
BRBCL	5679.1	5204.4
Darlipali STPS	8789.687	8356.7
FSTPP - I & II	9148.115	8495.9
FSTPP-III	3250.629	2909.1
KHSTPP-I	5872.474	5286.9
KHSTPP-II	10713.46	9604.9
MTPS-II	2561.842	2340.2
NPGC	7934.154	7499.0
Talcher STPP	7147.712	6698.3
Rangit HEP	343.2749	331.1
Teesta-V HEP	2758.317	2647.5



The details of net exchange of actual energy (MU) from Eastern Region including transmission loss with other regions for the year 2021-22 [Import (+) / Export (-)] is furnished below:

WR	SR	NR	NER	TOTAL
2468.2	-19782.5	-29559	-1565	-48438.3

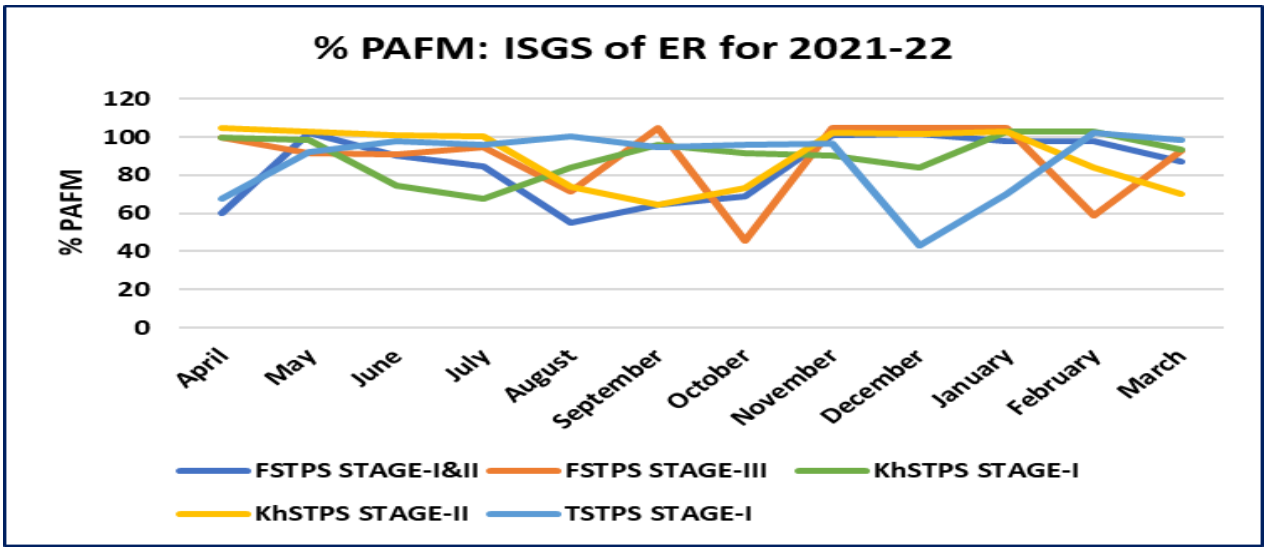


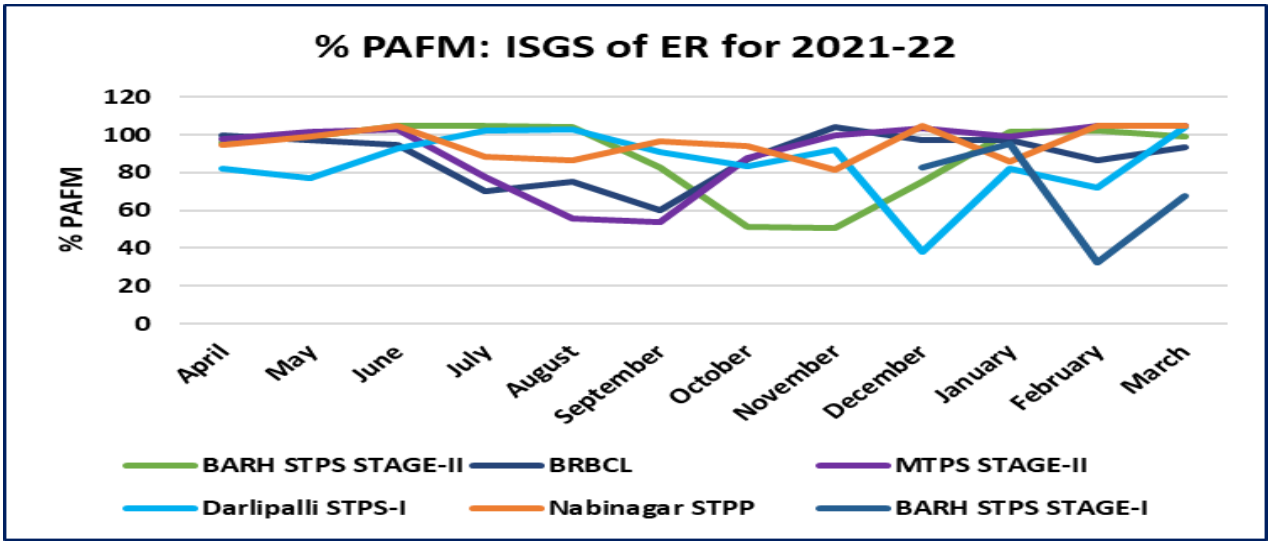
4.1.4 PAF & Schedule PLF of ISGS Thermal Stations in ER in F.Y 2021-22:

Plant Availability Factor (PAF) refers to whether a plant is available for generation or not. PAF of a generating station means the average of the daily declared capacities (DCs) for the period expressed as a percentage of the installed capacity in MW less the normative auxiliary consumption. The annual fixed cost (AFC) of a generating station would be recovered based on the cumulative availability of station.

Schedule PLF of a plant refers to percentage schedule generation against its schedule generating capacity. It is used for recovery of primary and secondary fuel cost of station and charged to beneficiaries to the extent of their drawl schedule.

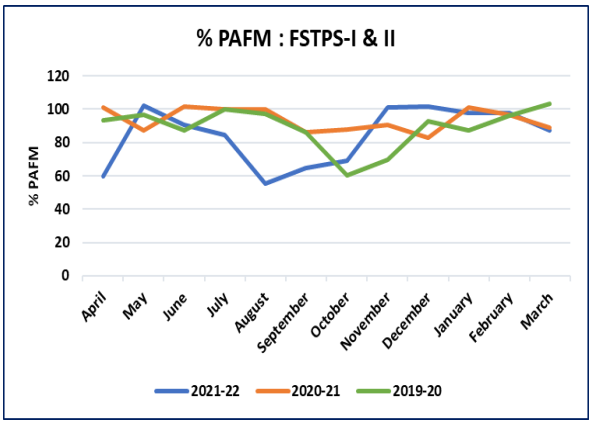
The month wise Plant Availability Factor (PAF) & Schedule PLF for year 2021-22 for NTPC stations in Eastern Region is shown below:

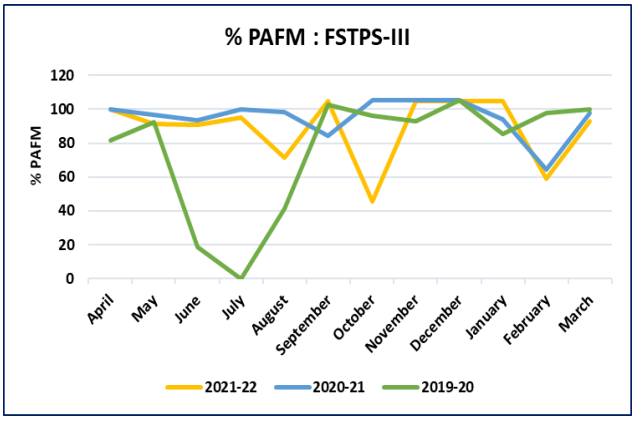


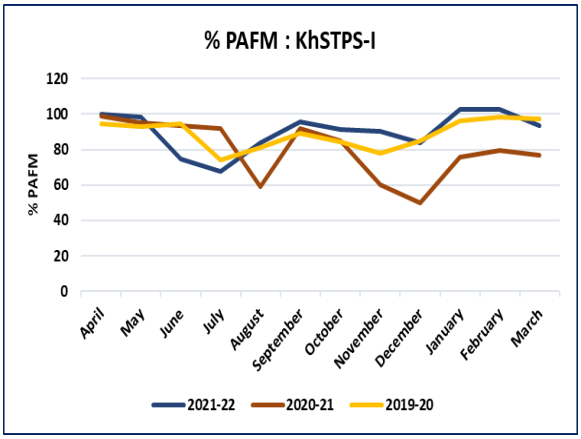


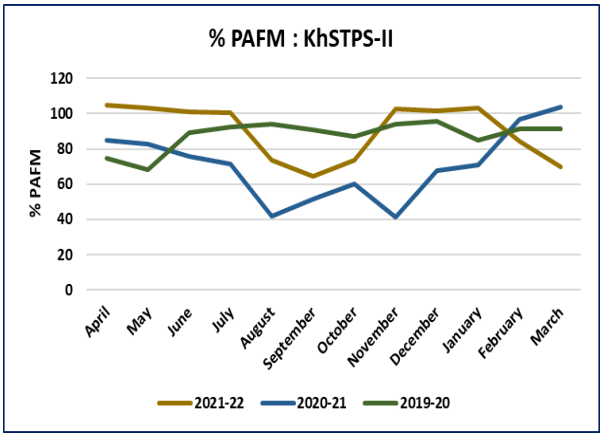
Comparative Performance of NTPC Thermal Generating Stations in ER:

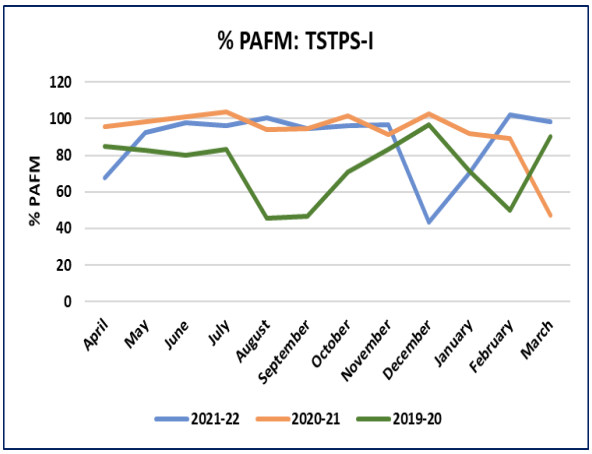
The month wise Plant Availability Factor (PAF) for years 2019-20, 2020-21 & 2021-22 for NTPC stations in Eastern Region is illustrated below:

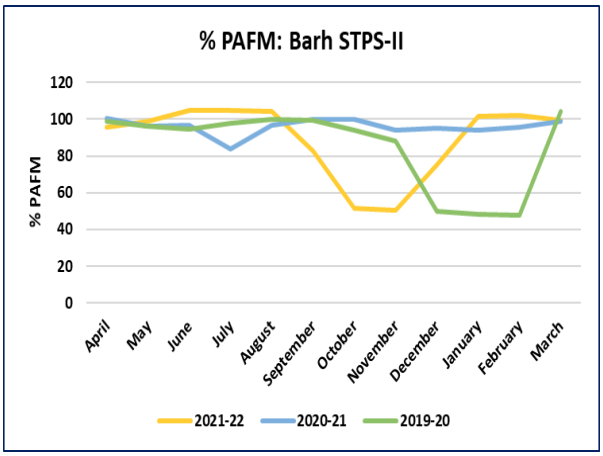


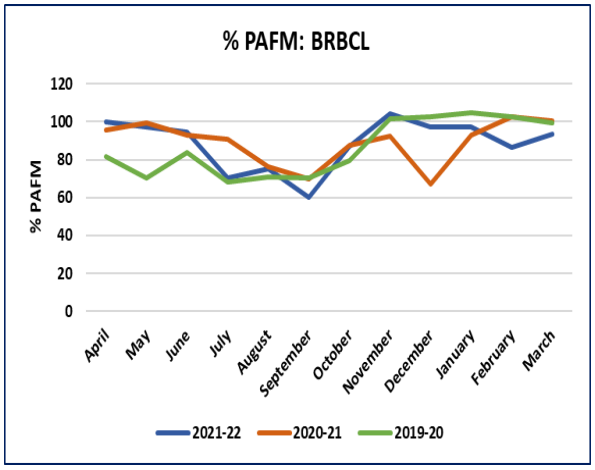


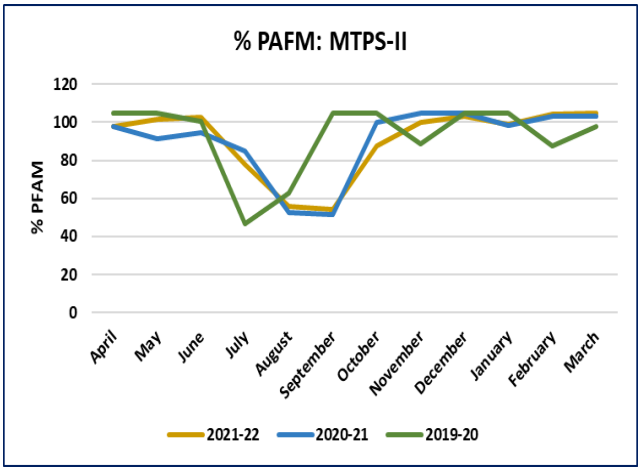


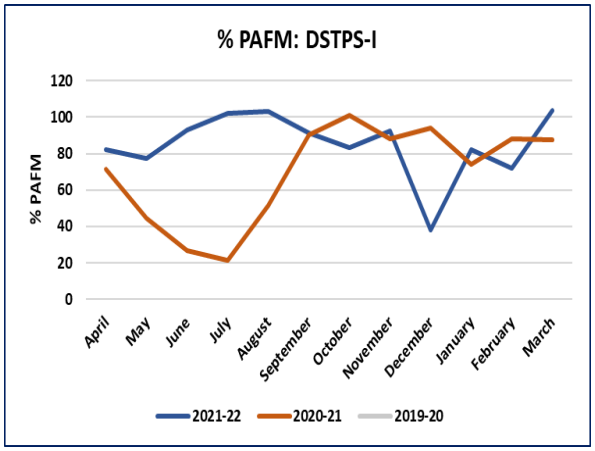


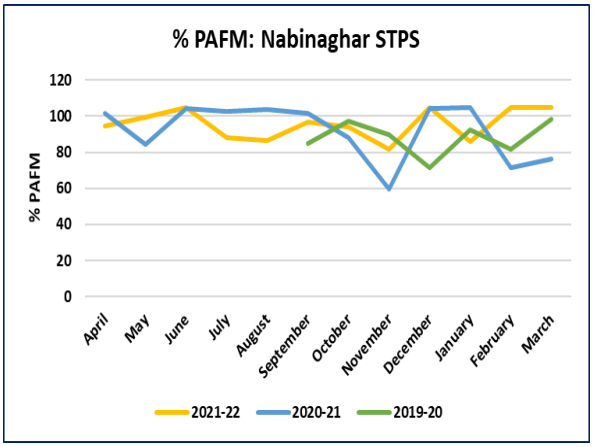




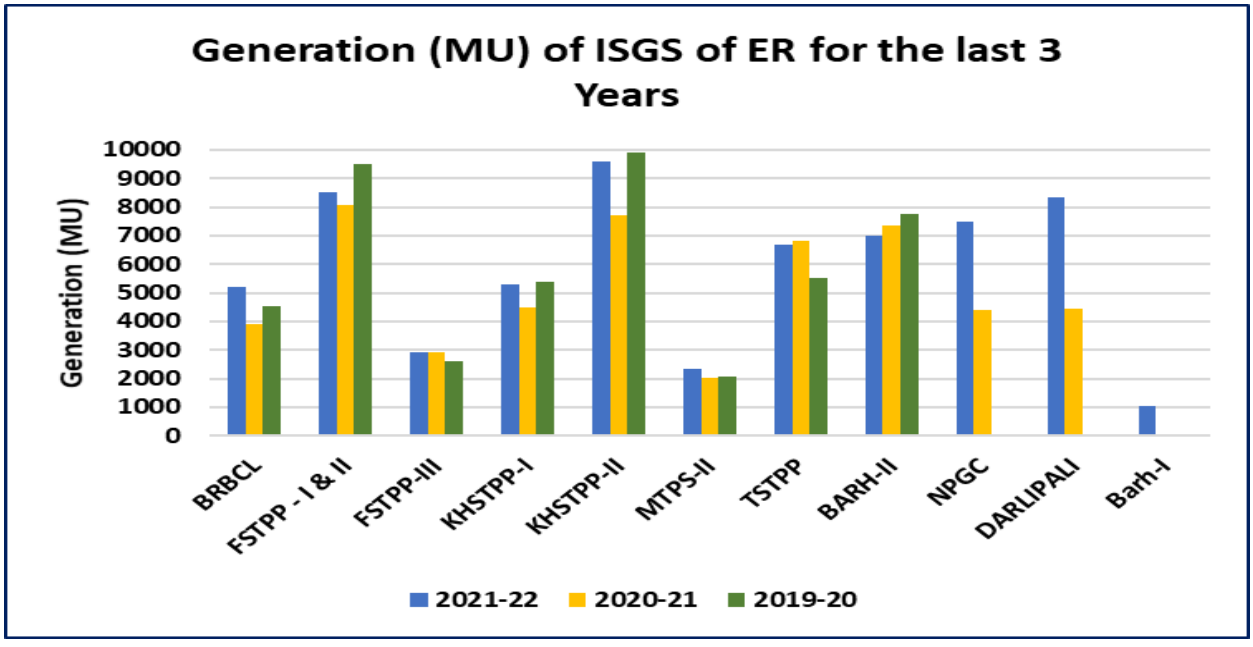






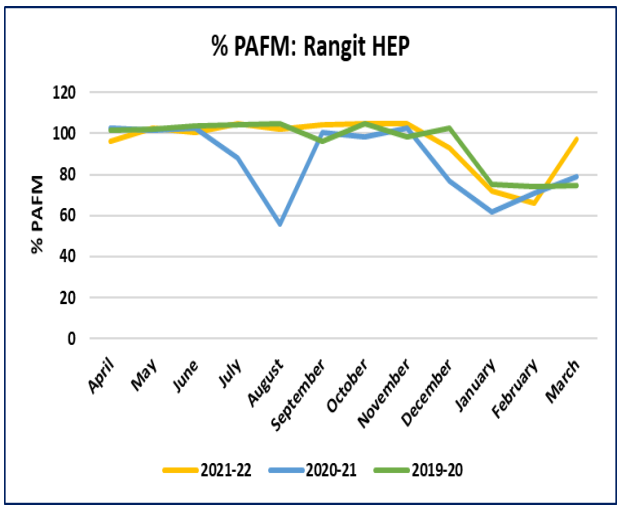


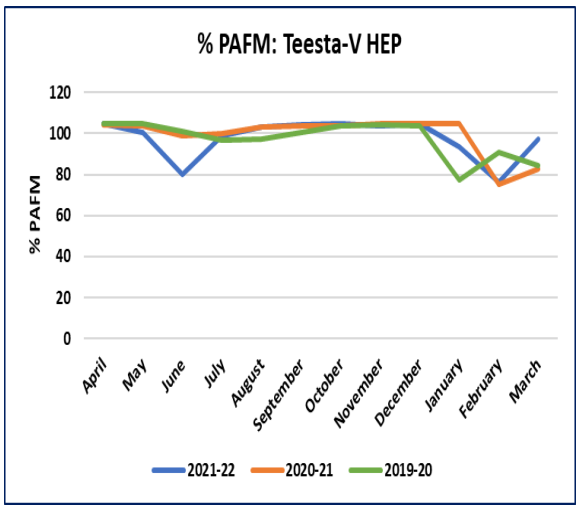
Actual Generation of NTPC Stations of ER for the last three years has been shown below:



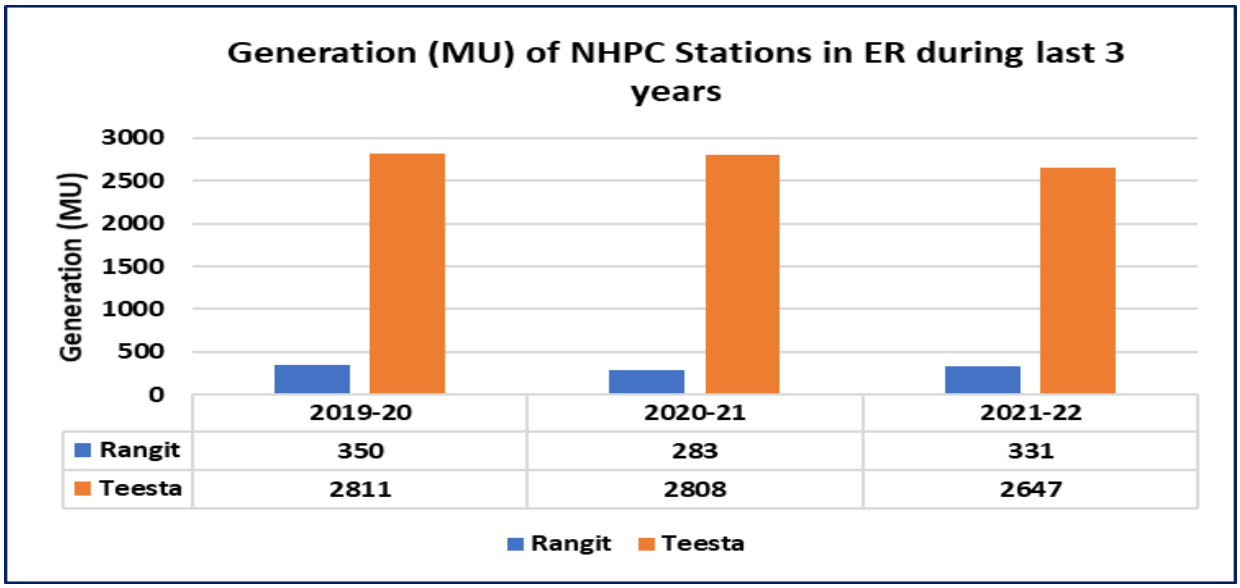
4.1.5. Performance of NHPC stations in ER:

The month wise Plant Availability Factor (PAF) for years 2019-20, 2020-21 & 2021-22 for NHPC stations in Eastern Region is shown below:





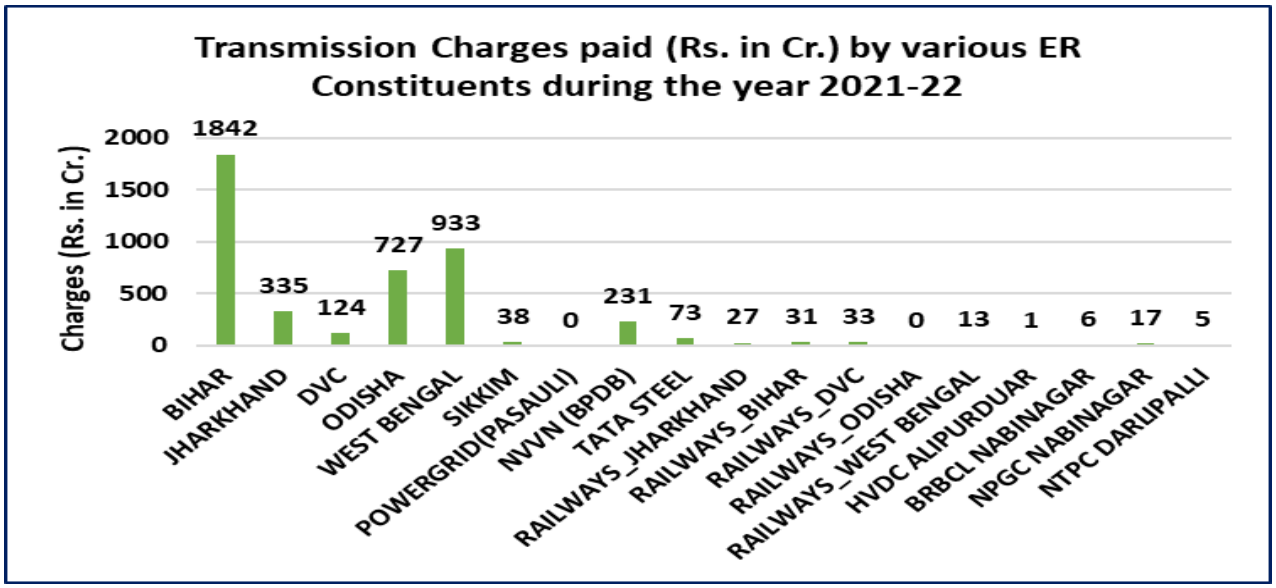
Actual Generation of NHPC stations of ER for the last three years has been shown below:



4.2 TRANSMISSION CHARGE

4.2.1 Regional Transmission Account:

The Regional transmission charges are the charges payable for the energy transacted through the Inter State Transmission network which are billed by the CTU as published by the RPC secretariat. The transmission charges of the beneficiaries are calculated based on CERC (Sharing of Inter-State Transmission Charges & Losses) Regulations, 2020 which are notified for implementation from November-2020.



Regional Transmission Account is being prepared by ERPC Secretariat based on the new methodology as per the data furnished by NLDC, which is also the Implementing Agency for these new regulations. The Regional Transmission Accounts is issued for the recovery of transmission charges corresponding to Long term open Access and Medium-term open Access transactions. A transmission charge paid by various constituents of Eastern Region during the year 2021-22 is furnished in **Annexure- XV.**

4.2.2 Transmission Charges for Short Term transactions:

In case of bilateral and collective transactions, transmission charges for the energy approved for transmission separately for each point of injection and for each point of drawl, shall be payable in accordance with the provisions of Central Electricity Regulatory Commission (Sharing of Inter State Transmission Charges and Losses) Regulations, 2020 and as amended from time to time.

The intra-State entities shall pay the transmission charges for use of the State network as fixed by the respective State Commission in addition to the charges specified under clauses (1) of the above regulation. Where the State Commission has not determined the transmission charges, the charges for use of respective State network shall be payable at the rate of Rs.80/MWh for the energy approved.

4.3 COLLECTION & DISBURSEMENT OF SHORT-TERM TRANSMISSION CHARGES:

The Transmission charges and the operating charges payable by the utilities allowed for short-term open access shall be indicated by nodal agency while approving the Open Access. The Transmission charges payable for Inter-State Transmission system and Transmission Charges for State network shall be indicated separately. The Transmission Charges and the Operating Charges shall be collected by the nodal agency except for transmission charges for State network in the case of collective transaction.

The transmission charges collected by the nodal agency for use of the transmission system other than State network, for a bilateral or collective transaction for each point of injection and each point of drawl shall be given to Central Transmission Utility (CTU) for disbursement. The CTU shall disburse these transmission charges to the long-term customers of the synchronously connected grid where the point of injection or point of drawl is situated, as the case may be, in proportion to the monthly transmission charges payable by them after adjusting against Long-term Access to target region in accordance with the Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 as amended from time to time. The transmission charges for use of State network shall be disbursed to the State Transmission Utility concerned.

4.4 OPEN ACCESS AND BILATERAL ENERGY TRANSACTIONS

4.4.1. Bilateral Trading 2021-22

Short term transactions are governed by "Central Electricity Regulatory Commission (Open Access in inter-State Transmission) Regulations, 2008" as amended from time to time for exchange of energy (MWh) between a specified buyer and a specified seller, directly or through a trading licensee or discovered at power exchange through anonymous bidding.

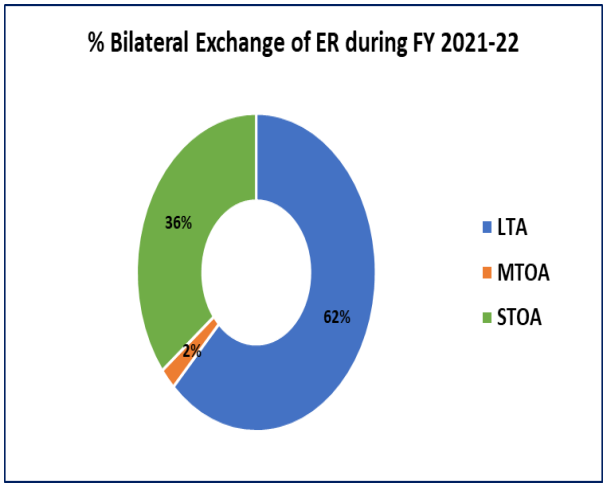
Trading of power in line with the CERC regulations on Short Term Open Access in transmission system started in Eastern Region with effect from 06.05.2004, and over the years the volume of bilateral trade has seen continuous increase. The number of traders and utilities indulging in bilateral trade and collective transactions through the IEX and PXI has also seen healthy growth. The indicative volume of trade in Eastern Region during 2021-22 by various traders through LTA, MTOA & STOA is provided in **Annexure – XXIV**.

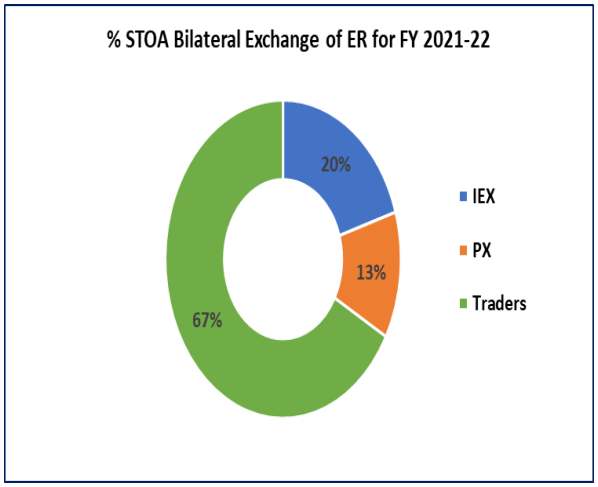
TRADERS involved in Short Term Transactions in ER	
AEL_Trader	MPPL Trader
APPCPL	NPCL(UP)
APPCPL_Trader	NR-DEL
APPL_Trader	NR-UP
BSL	NVVNL
CESC	POWER_EXCHANGE
CHUZACHEN	PTC
DB Power	PXIL
ECRD	RUVNL
ESIL_WR_Beneficiary	SAIL-RSP
GMR	SGPLNLR
GMRETL Trader	TATAHALDIA
IEXL_Trader	TATASTEEL
IPCL	TATASTL_BSL
IPCL_Trader	THEP
ITC_Munger	TPTCL_Trader
JBVNL	TSFAP_JODA
JITPL	TSKPO
JLHEP	TSL Joda
JSWEL	TSPJO
KEIPL	WBSEDCL
MANIKARAN	

The bilateral transactions consist of long term, medium term and short-term trades through traders, direct or via IEX/PXI. The participants in the short-term market trade electricity to meet short term demand or surplus situation or peaks requirement. It is also helpful in evacuation of generators for which LTA have not yet operationalized due to various constraints.

While short term market helps in balancing the energy pool by making small adjustments, it suffers from lack of assured access in case of congestion and depleted network scenario.

The breakup of bilateral trades in LTOA, MTOA, IEX/PXI, Direct and via Traders in Eastern Region is provided in the Pie-Chart as given below:



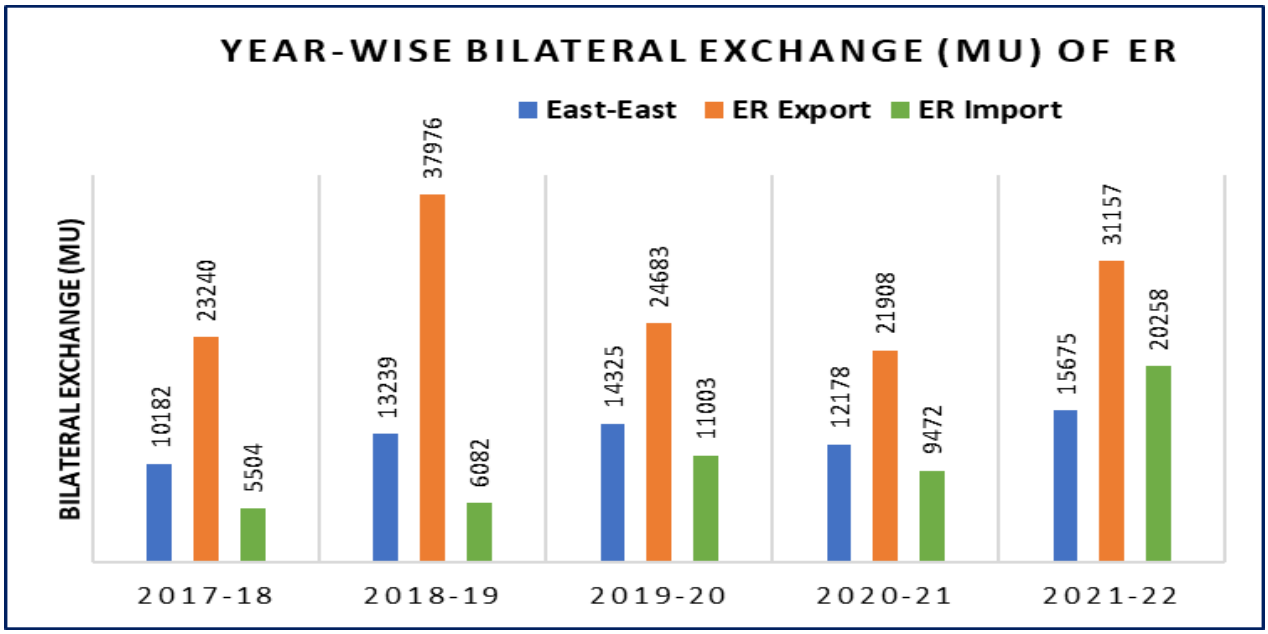


Figures in MU

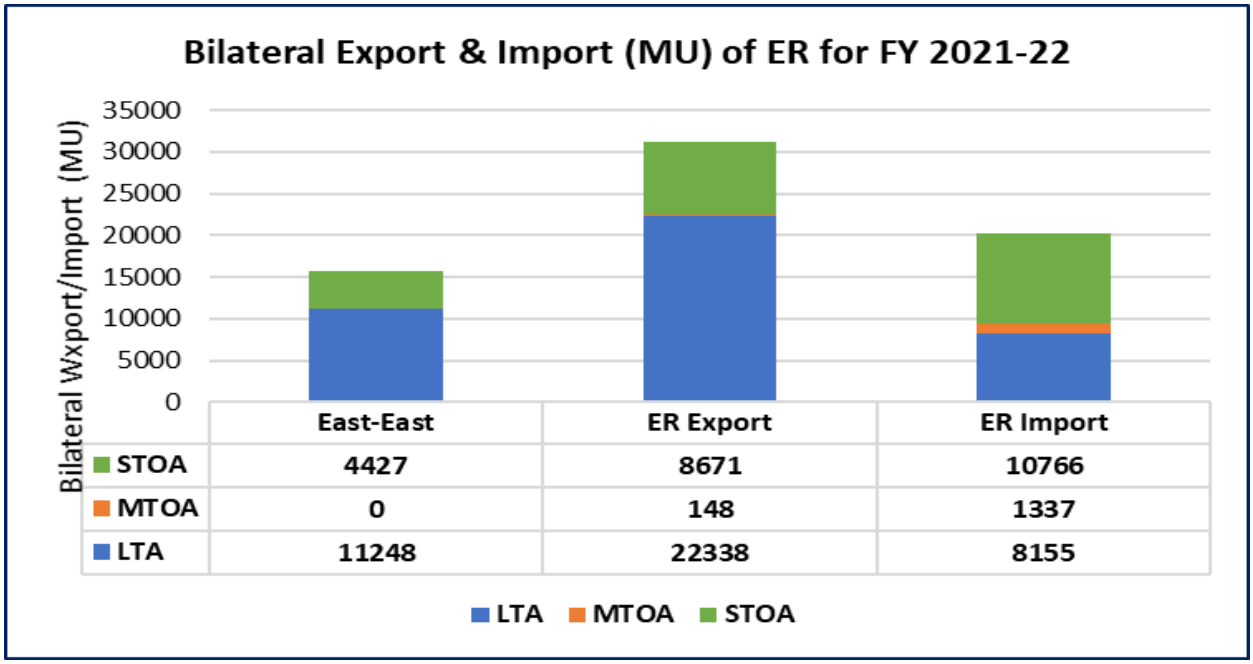
Long Term & Medium Term		Short Term Bilateral Transactions	
LTOA	MTOA	IEX/PXI	Traders
41741	1485	7898	15967

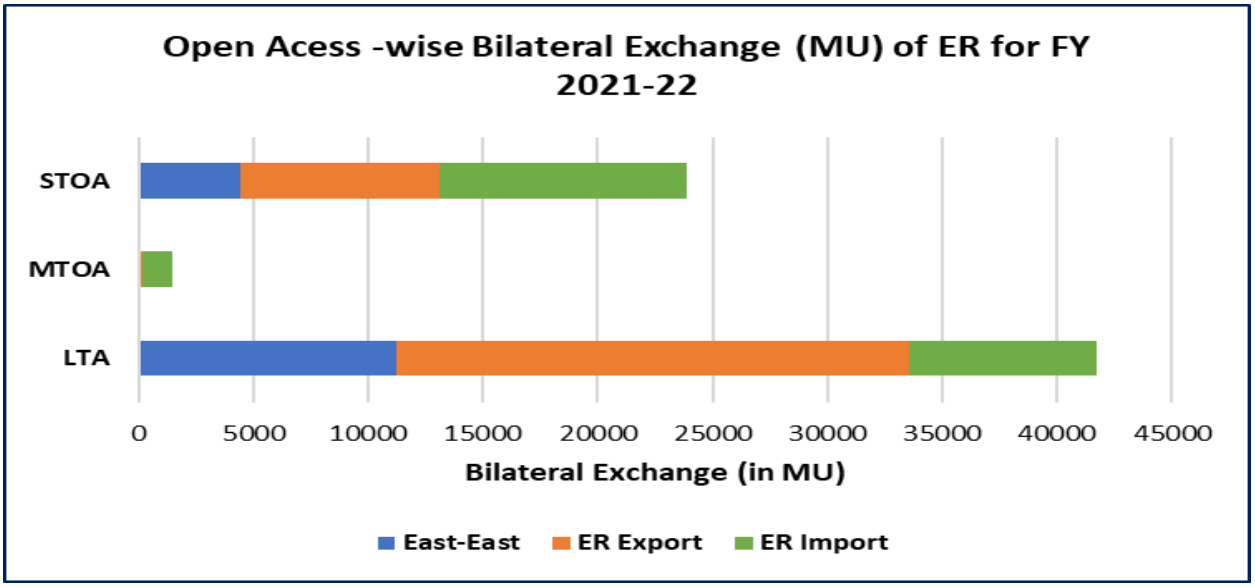
During 2021-22, scheduled bilateral transaction of power through ER was to the tune of 67,090 MU. The breakup of year on year scheduled bilateral transactions has been shown below for years 2017-18, 2018-19, 2019-20, 2020-21 & 2021-22.

It has been indicated that the out of total bilateral transactions the contribution of short-term open access was 36 %, medium-term open access was 2 % and LTA was about 62 %. Due to introduction of various products of power procurement by power Exchanges like Real time market through which the states are meeting their power demand in shortest possible time. In the short-term market the share of the IEXL is 20% and PXIL was 13 % and the bilateral traders is about 67 %.



During the year substantial amount of transaction took place through IEX/PXI by means of anonymous bidding. The quantum of energy transactions in MU through different open access segments such as LTA, MTOA & STOA within ER Export from ER and import to ER has shown.

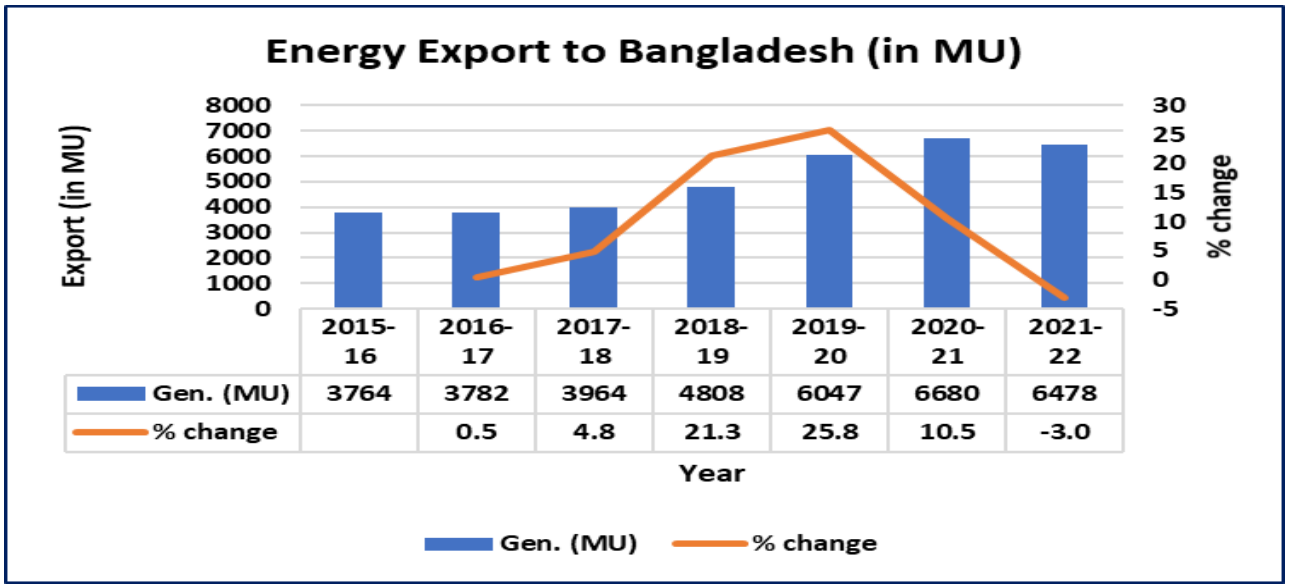




4.4.2 International Trades for year 2021-22

4.4.2.1 Trading of Power with Bangladesh:

Based on MoU between the two countries of India and Bangladesh, Ministry of Power, Govt. of India allocated 250 MW power round the clock (in Stages) to Bangladesh from coal based NTPC stations in the country. NTPC Vidyut Vyapar Nigam Ltd. (NVVN) as nodal agency has entered into a Power Purchase Agreement (PPA) with Bangladesh counterpart (BPDB) through cross border trading of power and to facilitate delivery of such power.



Accordingly, the export of power from India (through 400 kV Behrampur (West Bengal) – Bheramara (Bangladesh) D/C line and 500 MW HVDC back-to-back at Bheramara to Bangladesh through BPDB commenced from 05.10.2013. The 2nd 500 MW Back to Bach HVDC block was commissioned in June-2018. Presently 800 MW power is being exported to Bangladesh comprising 250 MW (Net 232.42 MW) power from NTPC Stations, 300 MW Long term power from DVC through NVVNL and 250 MW from SEMBCORP Private power plant. The actual energy (including transmission loss) exported to Bangladesh during 2021-22 was to the tune of 6478 MU from Eastern Region.

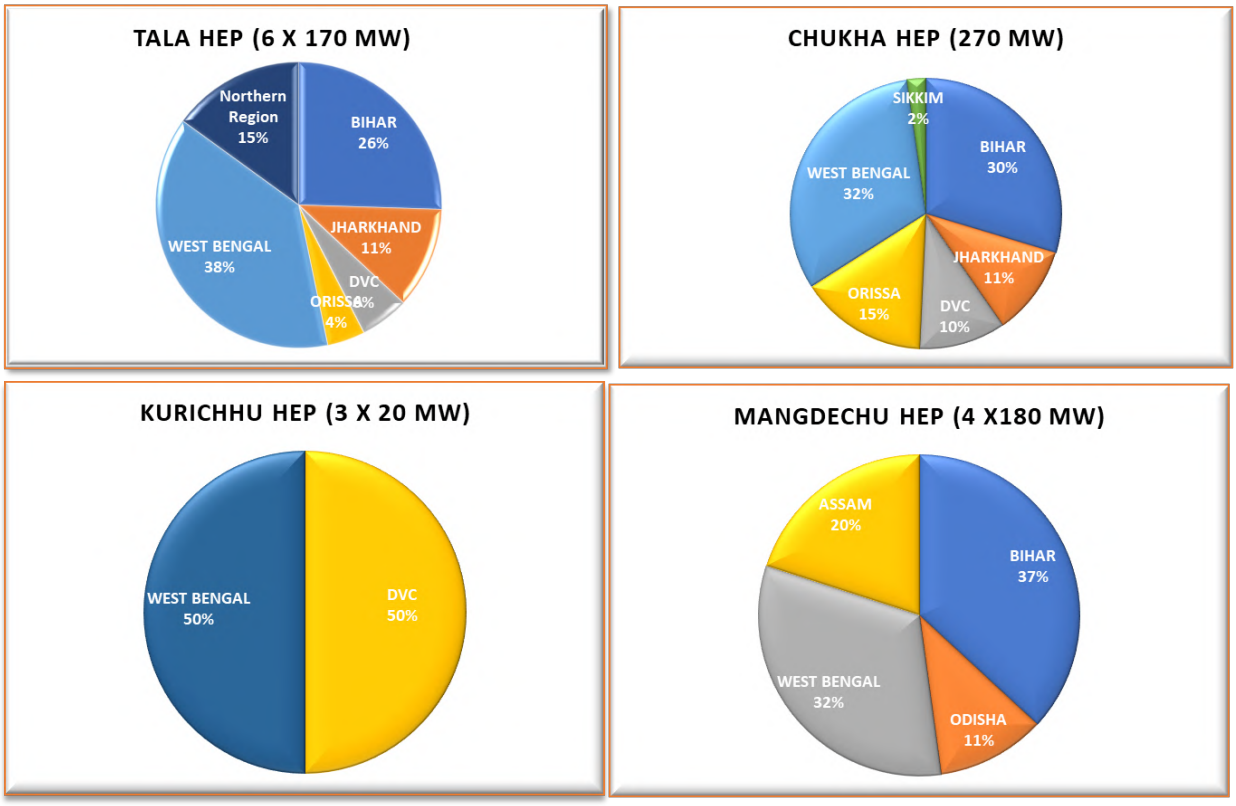
4.4.2.2 Trading of power with Bhutan:

Over and above the availability of power from NTPC and NHPC stations in ER, the region has imported power from Govt. of Bhutan through PTC and TPTCL as given below:

Import to India from	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Bhutan	5420.4	5824	5072.08	4395.87	6350.6	9251.7*	7939.4$

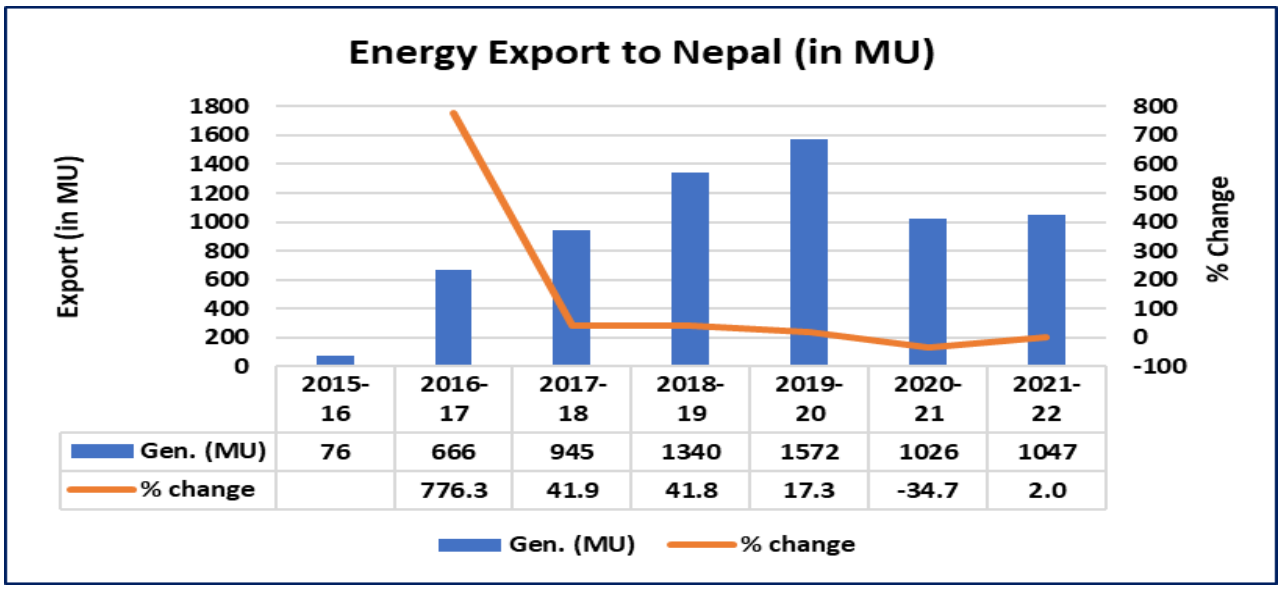
*Excluding export of 53 MU to Kuruchhu HEP of Bhutan.
$Excluding export of 228.7 MU by HEPs of Bhutan.

As per GoI orders the majority of power from Hydro stations of Bhutan has been allocated to Eastern Region States as shown below:



4.4.2.3 Trading of power with Nepal:

Energy exported to Nepal during 2021-22 to the tune of 1047 MU (including transmission loss) mainly through NVVN trader.



4.5 LONG TERM AND MEDIUM-TERM ACCESS

Long term transactions are governed by "Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations, 2009" on 07.08.2009.

The LTA & MTOA status from Eastern Region informed by NLDC as on 31.03.2022 is given at **Annexure-XXIV.**

4.6 COMMERCIAL DECLARATION OF NEW GENERATING STATIONS IN ER

During the year 2021-22, there was addition of 2733 MW generating capacity in Eastern Region. Out of which, 2620 MW capacity is thermal and 113 MW is Hydro. Details of commercial declaration of new generation stations is given at **Annexure-IV(B)**.

4.7 SOLAR POWER GENERATION IN THE REGION

The renewable sources of electricity have zero marginal cost and are must run in nature. The development of Solar Power generation in India has been initiated for quite some time. The development of solar power generation process confronts several barriers like financial, investment, technology, institutional and other incidental factors. To overcome these barriers substantial support is required for development of solar power generation. Foremost among them is the relatively high cost of solar generation. Several options were explored to give incentive to the cost of solar power and the option of "bundling" solar power with the power out of the cheaper

unallocated quota of Central Coal based Stations and selling this bundled power to state distribution utilities at the CERC regulated price was decided.

In order to facilitate grid connected solar power generation in the first phase, the Mission provides for NTPC Vidyut Vyapar Nigam (NVVN) to be the designated Nodal Agency for procuring the solar power by entering into a Power Purchase Agreement (PPA) with Solar Power Generation Project Developers who will be setting up Solar Projects during the next three years, i.e. Before March 2013 and are connected to a grid at a voltage level of 33 kV and above. For each MW of installed capacity of solar power for which a PPA is signed by NVVN, the Ministry of Power (MoP) shall allocate to NVVN an equivalent amount of MW capacity from the unallocated quota of NTPC coal-based stations and NVVN will supply this "bundled" power to the Distribution Utilities.

Solar power bundling implemented in ER at present:

1) Ministry of Power (GoI) has allocated 5 MW of power to Odisha from the un-allocated power of coal based NTPC power stations in Eastern Region for bundling with the power from 5 MW solar PV power project of M/s Aftab Solar in Odisha [under JNNSM scheme (Phase-I)]. The same has been made effective from 01.05.2012 in the Regional Energy Accounts (REA) of ER.

2) Ministry of Power (GoI) has allocated 5 MW of power to GRIDCO from the un-allocated power of coal based NTPC power stations in Eastern Region for pooling with the power from 5 MW Dadri solar power project of NTPC. The same has been made effective in the Regional Energy Accounts (REA) of ER with effect from 00:00 hrs. of 30.03.2013.

3) Ministry of Power (GoI) has allocated un-allocated power of NTPC stations in ER for bundling with 65 MW of solar power from Rajasthan with effect from 00:00 hrs. of 16.08.2013 in favour of Gridco: 10 MW; West Bengal: 35 MW; DVC: 15 MW; and Assam: 5.

4) Ministry of Power (GoI) has allocated 5 MW of power to DVC from the un-allocated power of coal based NTPC power stations in Eastern Region for bundling with the power from 5 MW Talcher solar power project of NTPC. The same has been made effective in the Regional Energy Accounts (REA) of ER with effect from 00:00 hrs. of 28.03.2014.

5) Ministry of Power (GoI) has allocated 10 MW of power to DVC from the un-allocated power of coal based NTPC power stations in Eastern Region for bundling with the power from Unchahar solar power project of NTPC. The same has been made effective in the Regional Energy Accounts (REA) of ER with effect from 00:00 hrs. of 31.03.2014.

6) Ministry of Power (GoI) has allocated 5 MW of power to Gridco from the un-allocated power of coal based NTPC power stations in Eastern Region for bundling with the power from Faridabad solar power project of NTPC. The same has been made effective in the Regional Energy Accounts (REA) of ER with effect from 00:00 hrs. of 31.03.2014.

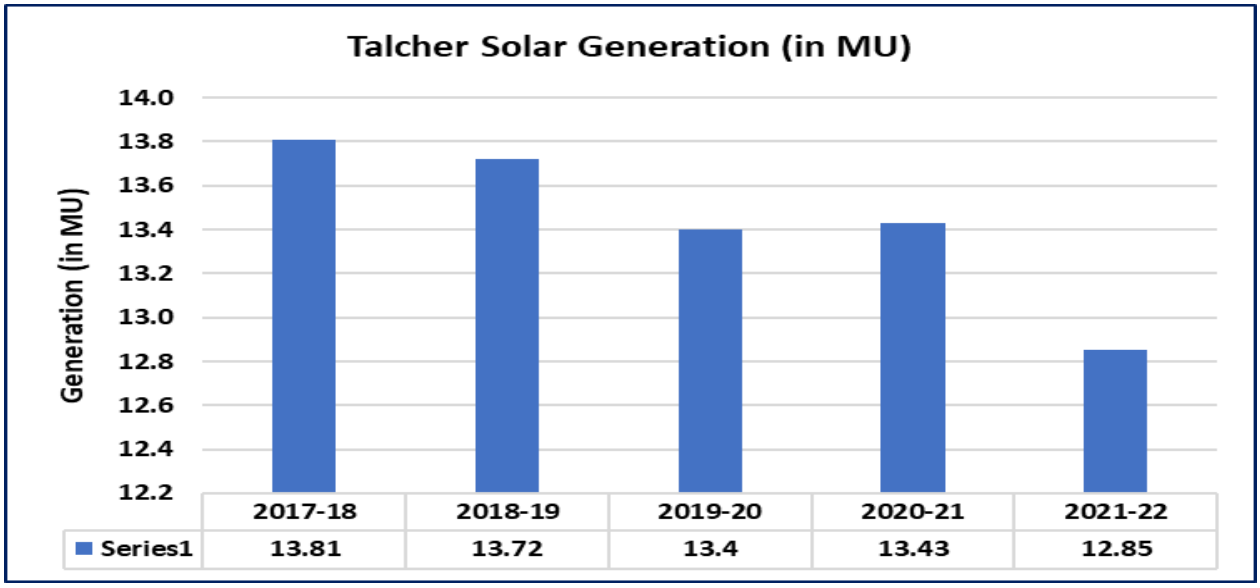
7) 25 MW of Solar Power from Rajasthan (M/s Sun Technique Solar Pvt. Ltd.) under the scheme of JNNSM Phase – I was allocated to West Bengal-15 MW, Odisha-5 MW, DVC-5 MW which have been implemented w.e.f. 00:00 Hrs. of 05.12.2014.

8) Subsequently, DVC has surrendered its share of 40 MW of coal power from ER NTPC stations and 1.09 MW from MTPS Stg-II, KBUNL w.e.f. 01.12.2017; the same has been allocated to Telangana for bundling with 100 MW of solar power under National Solar Mission Phase-II Batch-II Tranche-I.

9) Ministry of Power (GoI) has allocated 50 MW (41.09 MW surrendered power of DVC and 8.91 MW from Barh STPS) to Telangana for bundling with 100 MW of solar power under National Solar Mission Phase-II Batch-II Tranche-I w.e.f. 00:00 Hrs of 01.12.2017.

10) Total generation from Talcher Solar Station of NTPC for 2021-22 is 12.85 MU.

The variation in Generation of Talcher Solar Station for last five years is as given below:



4.8 FUNDS TRANSFERRED TO POWER SYSTEM DEVELOPMENT FUND FROM EASTERN REGION

The Power System Development Fund (PSDF) Regulations were notified by CERC on 04.06.2010. As per this regulation the following funds are transferred to the PSDF:

1. Congestion charges standing to the credit of the "Congestion Charge Account" after release of amounts payable to Regional Entities entitled to receive congestion charge along with interest, if any, in accordance with the Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009 as amended from time to time;

2. Congestion amount arising from the difference in the market prices of different regions as a consequence of market splitting in power exchanges in accordance with Central Electricity Regulatory Commission (Power Market) Regulations, 2010.

3. Unscheduled Interchange charges standing to the credit of the "Unscheduled Interchange Pool Account Fund" after final settlement of claims of Unscheduled Interchange Charges in accordance with the Central Electricity Regulatory Commission (Unscheduled Interchange Charges and related matters) Regulations, 2009 as amended from time to time;

4. RLDC reactive energy charges standing to the credit of Reactive Energy Charges Account.

4.9 DEVIATION SETTLEMENT MECHANISM (DSM)

4.9.1 Introduction

In ABT tariff system apart from Capacity (Fixed) charges and Energy charges the third important component is Deviation charges. It is the payment for deviations from schedule at a rate dependent on system conditions (Frequency) at that time. The deviation from schedule is technically termed as Unscheduled Interchange (UI) in ABT terminology. CERC vide its notification no No. L-1/132/2013/CERC dated 06.01.14 directed for implementation of Deviation Settlement Mechanism w.e.f. 17.02.2014 in place of UI regulations. With the implementation of this regulation, the UI regulation stood repealed.

For a generator, Deviation is the difference between Actual generation (ex-bus) and Schedule generation (ex-bus), whereas for a beneficiary, it is equal to Actual drawl (periphery) and Schedule drawl (periphery). Deviation charge is obtained by multiplying the Deviation with deviation rate. Deviation rate is a frequency dependent energy rate notified by Central Electricity Regulatory Commission. A constituent may receive/pay Deviation charge depending on whether it has assisted/undermined the grid frequency.

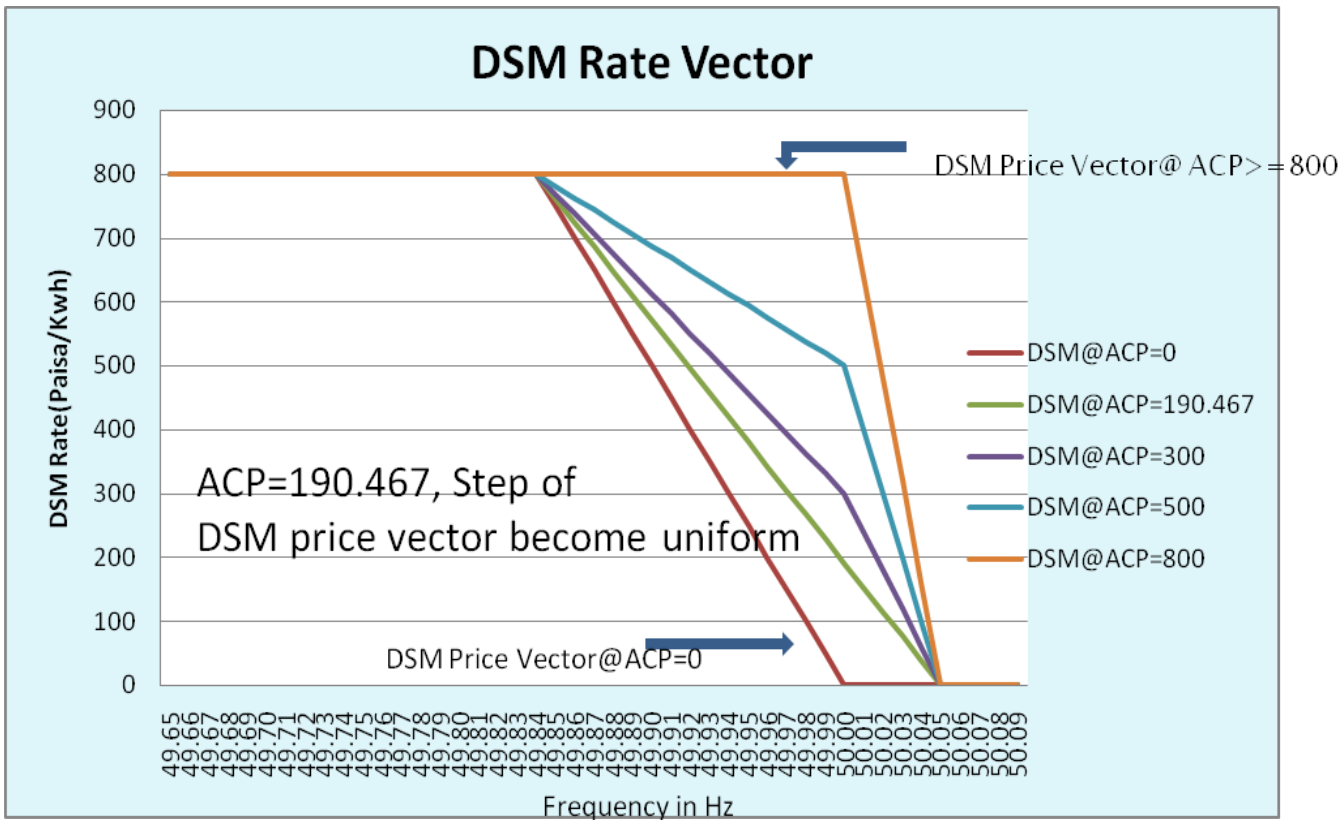
It acts like a financial barometer, which measures a licensee's responsiveness towards healthiness of the regional grid. The DSM mechanism has established a real time balancing market that is workably competitive and provides a powerful force for efficiency and innovation.

4.9.2 Rates for Deviation Charge with effect from 01.01.2019 are as under: -

The Deviation rate is a frequency-actuated signal available at any wall socket. Every utility reacts to this signal in real time and adjusts its generation/ demand and a new equilibrium is achieved. The Deviation curve by virtue of its design empowers every utility that has some means to regulate supply/demand to readjust its interchange with the grid and gain from the migration of frequency/UI rate from the earlier level. The decreasing marginal returns with every additional unit of deviation from the scheduled interchange acts as a counterweight, which forces the utility to seriously weigh the consequences of its actions.

Average frequency of the time block (Hz)		Charges for Deviation
Below	Not below	Paise/kWh
	50.05	0.00
50.05	50.04	1x(P/5)
50.04	50.03	2x(P/5)
------	------	------
50.01	50.00	P
50.00	49.99	50.00+15x(P/16)
49.99	49.98	100.00+14x(P/16)
------	-----	------
49.87	49.86	700.00+2x(P/16)
49.86	49.85	750.00+1x(P/16)
49.85		800.00

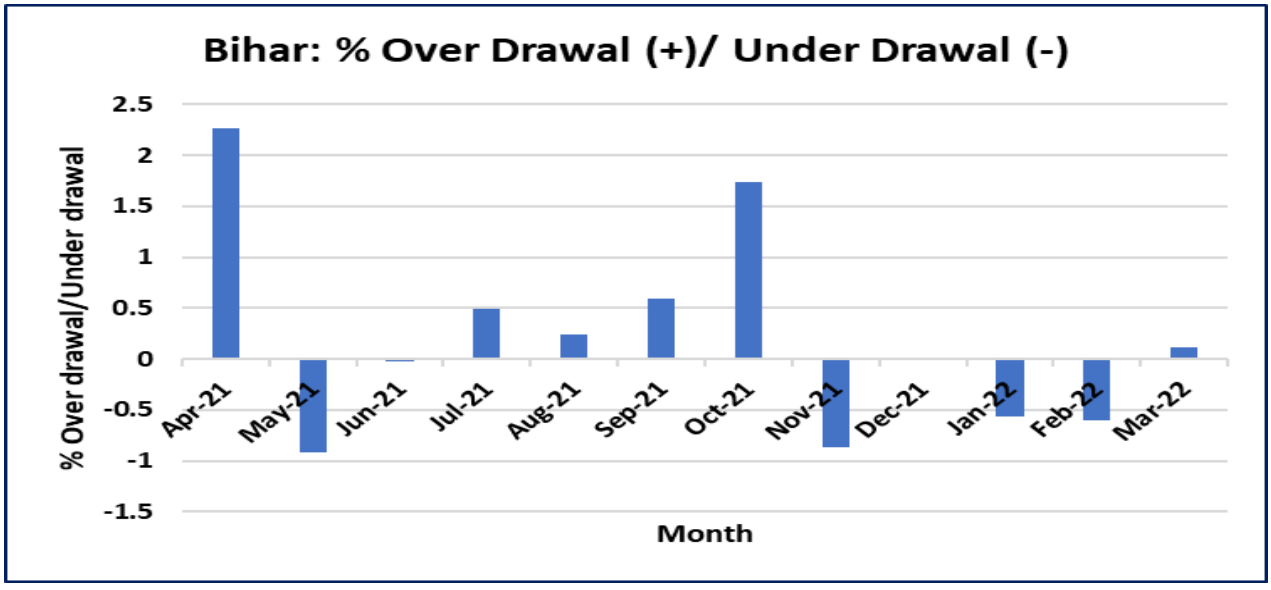
P= Average Area Clearing Price

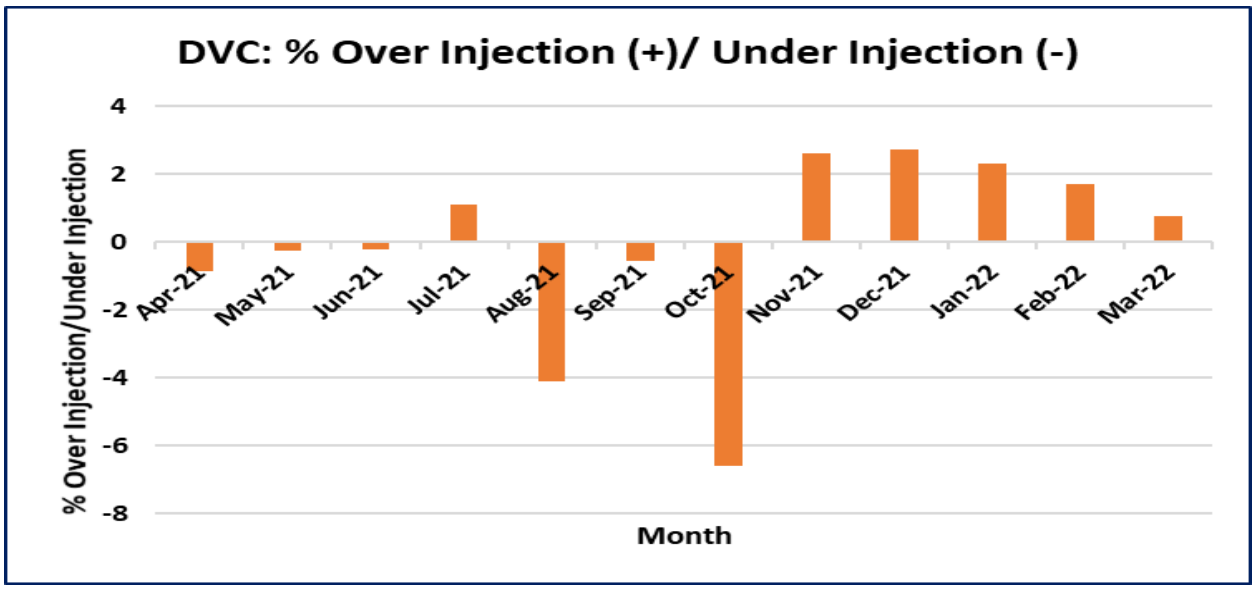


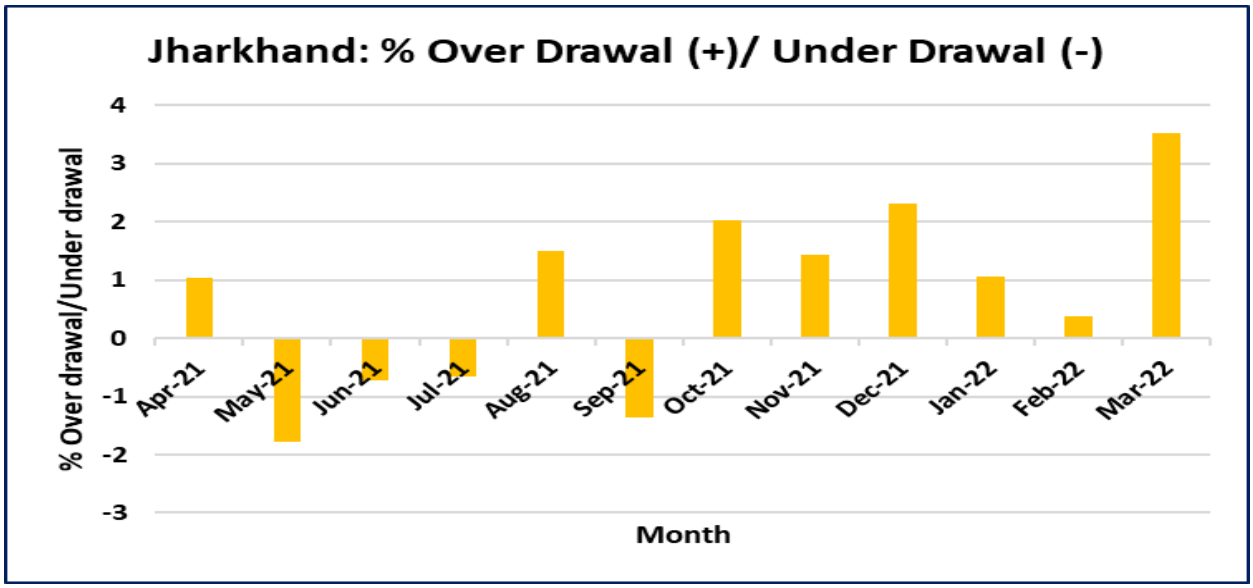
- As per DSM 4th Amendment, Charges for deviation below 49.85 Hz is fixed at 800p/u, for frequency 50.05 Hz and above, charges for deviation is 0 p/u.
- Charges for deviation at 50.00 Hz will be Daily Average Area Clearing Price (ACP) discovered at DAM (Max ceiling being 800 p/u).
- The Day-ahead market price of the Power Exchange having a market share of 80% or more in energy terms on a daily basis shall be taken into consideration for linking to the DSM price vector.
- If no single Power Exchange is having a market share of 80% or more, the weighted average day-ahead price of power Exchange of having market share of 20% & more shall be used for linking to the DSM price vector.
- DSM rate vector will have a dynamic slope determined by joining the identified price points at 50 Hz (daily avg. ACP),frequency below 49.85 (800p/u) and 50.05 Hz (0p/u) on daily basis.

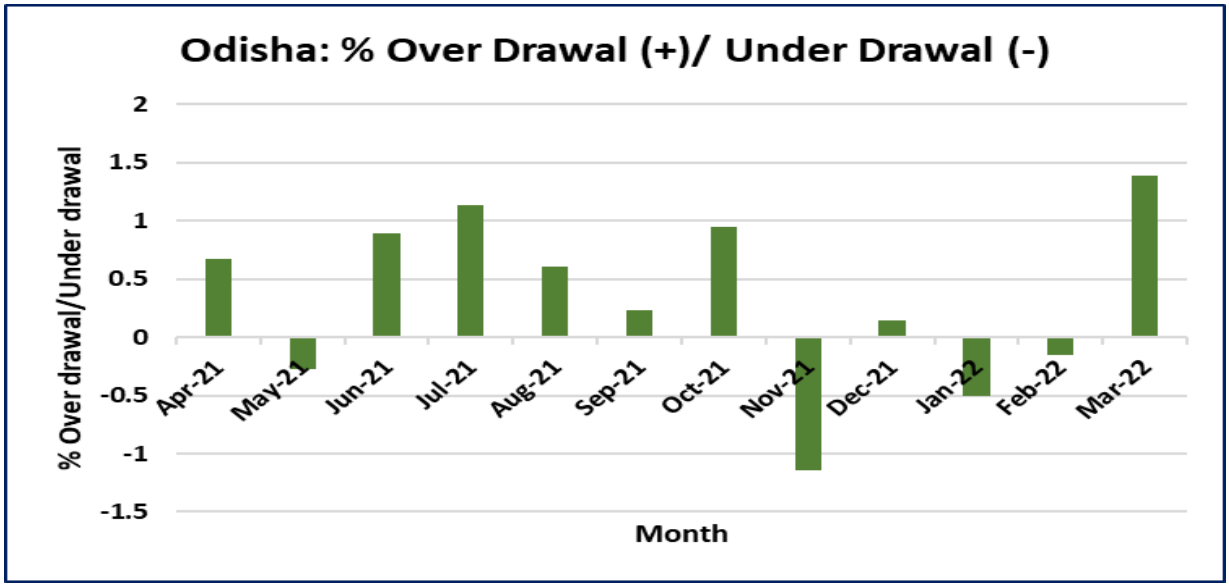
4.9.3 Performance of the constituents:

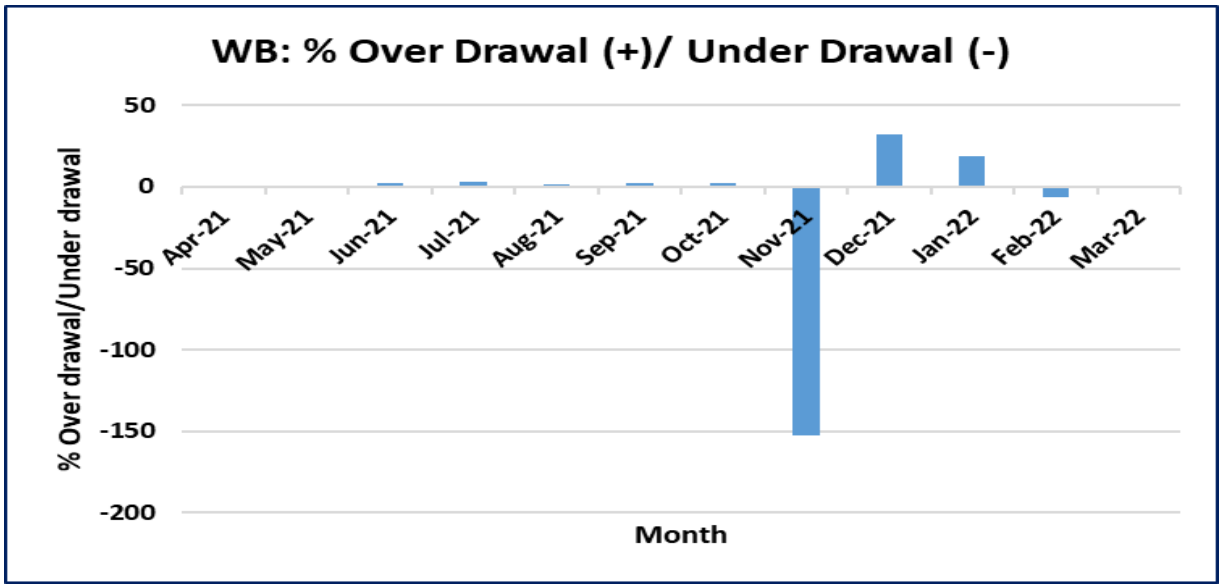
Details of month-wise Schedule Drawal/Generation, Actual Drawal/Generation, Receivable/Payable of UI/Deviation Charge amount for the year 2021-22 are furnished in **Annexure-XVII-A & Annexure-XVII-B**. Graphical representation is given below for ready reference.

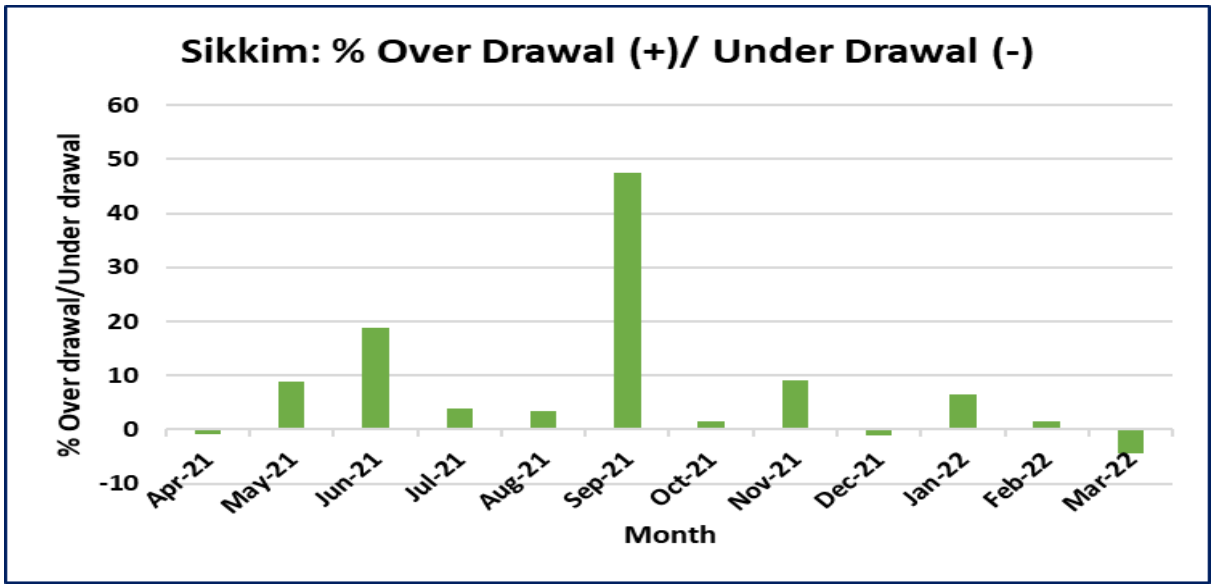



DVC: % Over Injection (+)/ Under Injection (-)
% Over Injection/Under Injection
4
2
0
-2
-4
-6
-8
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Month


Jharkhand: % Over Drawal (+)/ Under Drawal (-)
% Over drawal/Under drawal
4
3
2
1
0
-1
-2
-3
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Month


Odisha: % Over Drawal (+)/ Under Drawal (-)
% Over drawal/Under drawal
2
1.5
1
0.5
0
-0.5
-1
-1.5
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Month





4.10 REACTIVE ENERGY CHARGES:

Reactive power compensation should ideally be provided locally, by generating reactive power as close to the reactive power consumption as Possible. The Regional Entities except Generating Stations are therefore expected to provide local VAr compensation/generation such that they do not Draw VArs from the EHV grid, particularly under low-voltage condition. To Discourage VAr drawals by Regional Entities except Generating Stations, VAr Exchanges with ISTS shall be priced as follows:

i) The Regional Entity except Generating Stations pays for VAr drawl when voltage at the metering point is below 97%
ii) The Regional Entity except Generating Stations gets paid for VAr return when voltage is below 97%

iii) The Regional Entity except Generating Stations gets paid for VAr drawl when voltage is above103%

iv) The Regional Entity except Generating Stations pays for VAr return when Voltage is above 103%.

Provided that there shall be no charge/payment for VAr drawl/return by a Regional Entity except Generating Stations on its own line emanating directly from an ISGS.

As per IEGC, the beneficiary states of the region are billed for reactive energy exchange with the CTU system. ERPC also prepares reactive energy exchange for interstate system. The procedure for reactive energy charge calculation is governed by clause 1.6 and 1.7 of IEGC. The rate for reactive energy charge was 15.0 paisa/unit during the year 2021-22. The statement indicating reactive energy charge billing details during the year is enclosed at **Annexure-XVIII**.

4.11 REGIONAL TRANSMISSION DEVIATION CHARGES:

As per the CERC (Sharing of Transmission charges and Losses Regulations), 2020, the 'Regional Transmission Deviation Account (RTDA)' means the monthly account of Transmission Deviation charges issued by the Secretariat of respective Regional Power Committee on the basis of which the Central Transmission Utility shall raise the third bill in the billing month under prevailing regulations

Transmission Deviation, in MW, shall be computed as under:

a) *For a generating station:* The net metered ex-bus injection, in a time block in excess of the sum of Long-Term Access, Medium Term Open Access and Short-Term Open Access.

(b) *For a State*: The net metered ex-bus injection or net metered drawal, in a time block, in excess of the sum of Long-Term Access and Medium-Term Open Access.

(c) *For any drawee DIC*: This is a regional entity other than distribution licensees, net metered drawl in a time block in excess of the sum of Long-Term Access, Medium Term Open Access and Short-Term Open Access.

Transmission Deviation Rate in Rs./MW, for a State or any other DIC located in the State, for a time block during a billing month shall be computed as under:

TDR = 1.05 X (transmission charges of the State for the billing month in Rs.)/ (quantum in MW of Long-Term Access plus Medium-Term Open Access of the State for the corresponding billing period X 2880)

The transmission Deviation charges shall be recovered through the third bill and shall be reimbursed to the DICs in proportion to their share in the first bill in the following billing month.

4.12 ANCILLARY SERVICES

Power systems require ancillary services to maintain reliability and support their primary function of delivering energy to customers. Ancillary services are principally real-power generator control capacity services the system operator uses over various time frames to maintain the required instantaneous and continuous balance between aggregate generations and load. Ancillary Services consist of services required for:

a) Maintaining load – generation balance (frequency control)
b) Maintaining voltage and reactive power support
c) Maintaining generation and transmission reserves

Renewable energy generation is variable in nature (diurnal & seasonal) and implementation of ancillary services would facilitate integration of renewable energy generation in the country. Ancillary services will certainly help in controlling the variability of renewable generation.

- **Primary Control**

Continuous load changes result in mismatch of generation and load leading to variation in frequency of interconnected power system. Governors free to operate would enable smooth control of frequency fluctuations as well as security against grid disturbances. Time frame for primary governor control action is about a few seconds i.e. 2- 5 seconds.

- **Secondary Control**

If the load generation imbalance caused by an outage of large generator or load causing sudden variation in frequency of interconnected power system, primary response through governor action described above would help arrest the change fall in frequency. However, the frequency has to be brought back to 50 Hz through corrective action taken by the Control Area within which the generation or load is affected. Supplementary corrective action or secondary control has to be taken to bring frequency back to 50 Hz. For large interconnection system this automatic secondary control is known as Automatic Generation Control (AGC). Time line of secondary control action is a few minutes.

- **Tertiary Control**

Loss of large generator (or load) may cause a large enough system excursion that cannot be handled by regulatory reserve alone. The above secondary control reserves also need to be restored through tertiary reserves. Tertiary reserve provides significant insurance against wide spread outages.

The ancillary services are a potent tool in the hands of the system operator. The Central Commission is actively considering bringing in regulation to implement full-fledged ancillary services in the country.

4.13 RESERVE REGULATORY ANCILLIARY SERVICES (RRAS)

Ancillary services refer to functions that help grid operators maintain a reliable electricity system. Ancillary services maintain the proper flow and direction of electricity, address the imbalances between supply and demand, and help the system recover after a power system event. In the present system with significant variable renewable energy (RE) penetration, additional ancillary services may be required to manage increased variability and uncertainty.

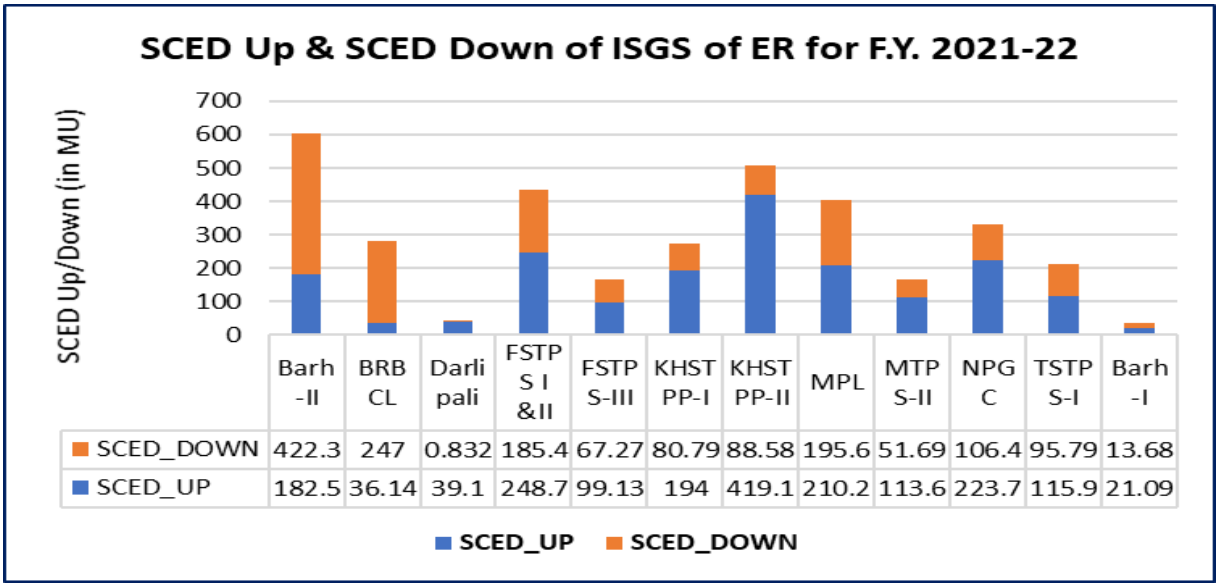
Currently, the reserve capacity of Central generators i.e. URS power has been considered as the tertiary reserve of the generators. Tertiary reserve provides significant insurance against wide spread outages. Tertiary reserve had been a luxury in our system that was perennially short of generation. Since generators reserve situation is getting better, it is proposed to use such surplus reserve by procuring tertiary reserve which can be utilised for frequency regulation of the national grid to avoid the deviation from desired frequency of 50 Hz.

As per Regulation 12 of the CERC (Ancillary Services Operations) Regulations 2015, the secretariat of Regional Power Committees (RPCs) is required to issue the weekly accounts for RRAS along with the weekly DSM accounts. The RRAS account include the fixed charges, variable charges and mark up charges. RRAS provider shall refund back the fixed charge to the original beneficiaries in proportion to the quantum surrendered from its generating station. The payments made from/to the DSM pool.

4.14 SECURITY CONSTRAINED ECONOMIC DISPATCH

CERC vide Suo-Motu order dated 31.01.2019 in petition no. 02/SM/2019 has directed implementation of SCED for the Inter-State Generating Stations on pilot basis w.e.f. 01.04.2019. RPCs and POSOCO have been directed to conduct stakeholder awareness programs for smooth implementation of SCED pan-India. Hon'ble Commission, vide Order in Petition No. 02/SM/2019 (Suo-Motu) dated 31st January, 2019, directed for Pilot on SCED of Inter-State Generating Stations (ISGS) Pan India.

The Central Commission observed that there is an overarching objective to optimize the Scheduling and dispatch of the generation resources and reduce the overall cost of Production of electricity without major structural changes in the existing System/framework. SCED is a desired step in the Indian grid operation towards optimization methodologies.



	Barh -II	BRB CL	Darli pali	FSTP S I &II	FSTP S-III	KHST PP-I	KHST PP-II	MPL	MTP S-II	NPG C	TSTP S-I	Barh -I
SCED_DOWN	422.3	247	0.832	185.4	67.27	80.79	88.58	195.6	51.69	106.4	95.79	13.68
SCED_UP	182.5	36.14	39.1	248.7	99.13	194	419.1	210.2	113.6	223.7	115.9	21.09

4.15 FAST RESPONSE ANCILLARY SERVICE

Hon'ble CERC vide its order dated 16.07.2018 in petition No.07/SM/2018/Suo-Motu directed for implementation of FRAS on pilot basis. FRAS pilot service implemented w.e.f. 26.11.2018. Fast Response Ancillary Services (FRAS) is a Frequency Regulation service. FRAS instruction has been given for every discrete 5-min time block starting from 0000 hrs of the day (e.g. 1000-1005, 1005-1010…). Central sector Hydro Generating Station with pondage/Storage facility will participate in FRAS pilot service (i.e. TEESTA-V & RANGIT of Eastern Region).

For implementing Hydro Power as FRAS, all constraints and commitments declared by the hydro stations shall be honoured and the total energy delivered over the day shall be maintained as declared by the hydro station. The total energy dispatched under FRAS shall be squared off by the end of the day. Triggering of FRAS shall be done on the stack prepared based on the balance energy available in the hydro station. The Schedules of the beneficiaries shall not be disturbed in the despatch of FRAS and the Payment for FRAS shall be based on "mileage" basis. The mileage during the day shall be computed as follows:

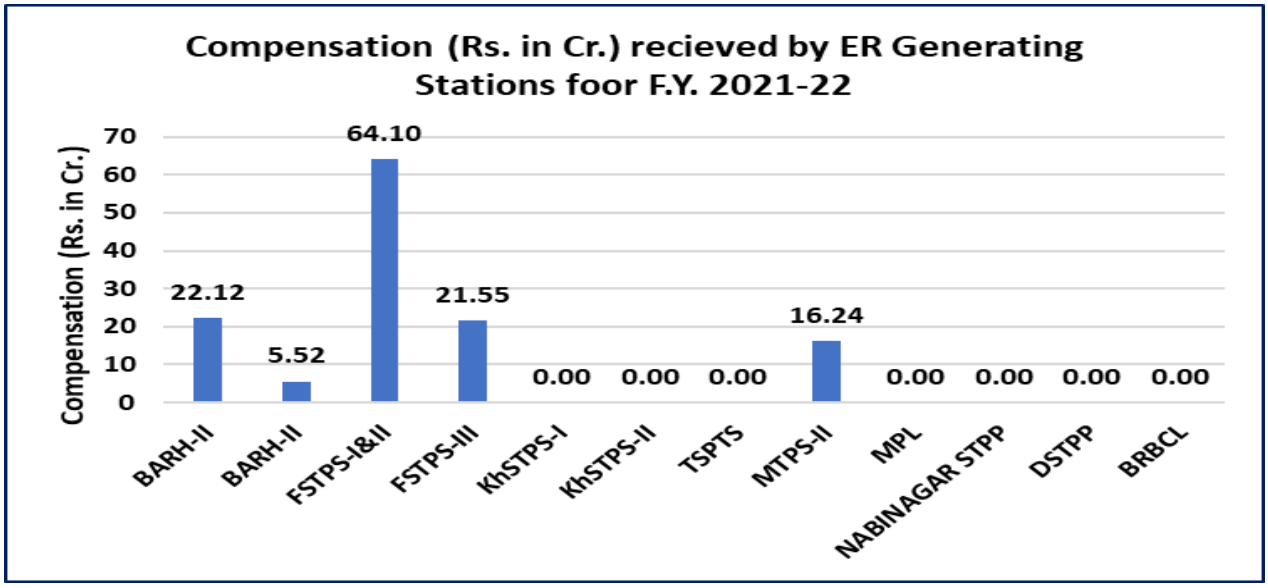
Net energy Enet = S(Eup) - S(Edown) (in MWh) (should be zero over the day)

Mileage Em = S | Eupt |+ S | Edownt| (in MWh)

No additional fixed charge or variable charges shall be paid for providing FRAS support. Existing fixed charges and variable charges shall continue to be paid by the beneficiaries for the normal schedules as per existing practice. The total energy despatched for hydro under FRAS shall be made zero and hence, no energy charges shall be payable to the hydro stations. Incentive shall be paid from the DSM pool on mileage basis at the rate of 10 paisa per kWh for both "up" and "down" regulation provided by Hydro station.

4.16 COMPENSATION FOR DEGRADATION OF HEAT RATE, AUX CONSUMPTION AND SECONDARY FUEL OIL CONSUMPTION, DUE TO PART LOAD OPERATION AND MULTIPLE START/STOP OF UNITS

Central Electricity Regulatory Commission (Indian Electricity Grid Code) (Fourth Amendment) Regulations, 2016, was notified on 6th April 2016. The Amendment Regulations contained provisions relating to Technical Minimum Schedule for operation of Central Generating Stations (CGS) and Inter-State Generating Stations (ISGS), whose tariff is either determined or adopted by the Central Commission. The Amendment Regulations further provided for compensation to Generating Stations for degradation of Heat Rate, Auxiliary Consumption and Secondary Fuel Oil consumption due to part load operation and multiple start-ups of units.



This Compensation Mechanism is applicable to Coal/Gas based Central Generating Stations and Coal/Gas based Inter-State Generating Stations, whose tariff is either determined or adopted by the Central Commission (hereinafter "designated generating stations"). In case of generating stations, whose tariff is neither determined nor adopted by the Commission but which is a regional entity, they shall be required to make appropriate provisions in their PPAs or any other supplementary agreement in the light of the Compensation Mechanism. Compensation received by various generating stations of Eastern Region during the year 2021-22 is furnished in **Annexure-XIX.**

4.17 Automatic Generation Control (AGC):

Automatic generation control (AGC), is a major control function within a utility's energy control centre whose purpose is the tracking of load variations while maintaining system frequency, net tie-line (tie line flow within a specified parameters) interchanges, and optimal generation levels close to scheduled (or specified) values. Automatic generation control (AGC) regulates power

generation in response to load changes through local feedback control measurements. Its main objective is to maintain system frequency (through variation in generation) and keep energy balanced within each control area in order to maintain the scheduled net interchanges between control areas.

Hon'ble CERC vide its order dated 6.12.2017 in petition no 79/RC/2017, directed for implementation of Automatic Generation Control. In compliance to CERC's direction, AGC was first implemented in NTPC Barh STPP in Eastern Region on 01st August 2019 and made operational since 23rd August, 2019.Vide order dated 28th August 2019, CERC in Petition No.: 319/RC/2018 directed that all the ISGS Stations whose tariff is determined or adopted by CERC shall be AGC-enabled and the ancillary services including secondary control through AGC shall be implemented.

All thermal ISGS stations with installed capacity of 200 MW and above and all hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC are directed to install equipment at the unit control rooms for transferring the required data for AGC as per the requirement to be notified by NLDC. AGC Settlement account of BARH STPS, KhSTPS-II, MPL, Tessta-V, NPGC, FSTPS-I & II and FSTPS-III is at **Annexure-XX.**

CHAPTER-5

ISSUES ON OPERATION, PROTECTION, COMMUNICATION AND SYSTEM STUDIES

ERPC Secretariat in general does not involve in day to day real time grid operation. However, it resolves the Operational issues including Protection, Communication, System Study etc. in the meetings of various sub-committees working under ERPC viz Technical Coordination Sub-committee (TCC), Operation Coordination Sub-Committee (OCC), Protection Coordination Sub-Committee (PCC) etc. Further for any emergent operational matters, it is resolved through mutual discussion between the ERPC Secretariat and concerned utilities. Sometimes Special committees/groups are formed comprising members from utilities to resolve/investigate/study such issues. Third Party Protection Audit, Under Frequency Relay (UFR) Audit etc. are such issues which were taken up by the various audit groups as formed by OCC/PCC. In view of smooth functioning of the regional grid and uninterrupted power supply to the core sectors i.e. Railways, Coal etc. healthy protection system has become an integral part of power system operation. Some major operational/protection issues which were taken up are placed below:

5.1 MOCK BLACKSTART EXERCISES IN EASTERN REGION

After any major grid disturbance causing total black out, restoration procedure starts with the Black Start operation of power stations which supply the initial power to neighbouring load centres and the system gradually restored. Mainly the hydro units, due to their flexibility in many fronts, are used as the main source for black start operation. Hence, it is given top priority to keep ready the hydro power stations of the region for any eventuality so that they could be used for black start operation. In line with directives of IEGC, every year OCC plans to conduct mock black start of hydro generating stations. During the year 2021-22, following hydro plants conducted the mock black start exercises.

Sl. No.	Power Plant	Organisation	Date of Mock black start
1	Rengali HEP	OHPC	18.08.2021
2	Subarnarekha HPS	Jharkhand	03.12.2021
3	Burla HEP	OHPC	15.12.2021
4	TLDP	NHPC	16.12.2021

As per the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010, under clause 5.8 (b) “Diesel Generator sets for black start would be tested on weekly basis and test report shall be sent to RLDC on quarterly basis”. Test-run of Diesel Generator sets on weekly basis for black start in Eastern Region were generally conducted and test reports were submitted by the concerned utility to ERLDC. Status reports are being regularly reviewed in OCC meetings.

5.2 UNDER FREQUENCY RELAY (UFR) OPERATION

In 9th National Power Committee (NPC) meeting held on 22.11.2019, it was decided that total quantum of load relief based on UFR operation would be 3320 MW for ER. It was also decided that UFR would be operational in 4 (four) stages, where Stage –I would be operated at 49.4 Hz, Stage-II at 49.2 Hz, Stage-III at 49.0 Hz and Stage-IV at 48.8 Hz. Accordingly, OCC distributed and implemented the total quantum of load relief as per existing proportion for ER constituents as given below:

Control Area	Stage-I (49.4 Hz) (MW)	Stage-II (49.2 Hz) (MW)	Stage-III (49.0 Hz) (MW)	Stage-IV (48.8Hz) (MW)	Total Relief by Control Area
BSEB	98	99	99	101	397
JSEB	61	62	61	62	246
DVC	134	135.5	136	137	542.5
Odisha	181.5	183.5	184	186	735
WBSETCL & CESC	345.5	350	350	354	1399.5
Total	**820**	**830**	**830**	**840**	**3320**

The operation of UFRs, if any, in the constituent systems is reviewed regularly in the monthly OCC meetings of ERPC.

5.4 INSPECTION OF UNDER FREQUENCY RELAYS (UFR)

The enquiry committee constituted by MoP after the major grid disturbances during 30th & 31st July'2012 recommended in its report (9.3) for ensuring proper function of defence mechanism like UFR etc. Also, as per section 5.2(n) IEGC, RPC Secretariat shall have to carry out periodic testing of UFR relays. In the 22nd TCC & ERPC meeting it was decided that UFR Audit of the ER constituents would be taken up by the UFR Audit group, nominated by the respective constituents.

Accordingly, a sub-group is constituted and have been carrying out inspection of UFR relays installed in Eastern Region regularly in the following manner:

i. In case secondary injection kit is available, frequency setting and ability of the Under-Frequency Relay to actuate may be tested with the injection kit.
ii. In case secondary injection kit is not available, then frequency setting of UFR may be reset within the operating frequency available at the time of testing and the ability of UFR to actuate may be checked.
iii. The previous history of relay operation along with requisite load relief may also be checked from logbook register maintained in the sub-station.

5.7 THIRD PARTY PROTECTION AUDIT OF EASTERN REGION

As a follow-up of one of the recommendations of Enquiry Committee headed by Chairman, CEA on grid disturbances that took place in Indian grid on 30th and 31st July 2012, Ministry of Power constituted a 'Task Force on Power System Analysis under Contingencies' in December 2012. As per the recommendations of Task force the third-party audit of the protection system needs to be carried out periodically.

The checklist of ERPC used in its 1st third party protection audit was modified in line with the recommendation by the Task Force committee and a road map for 2nd Protection Audit of ER was finalized in OCC & PCC meetings.

5.6 PROTECTION PHILOSOPHY OF EASTERN REGION

Several Special PCC meetings were convened to review the zone settings based on CEA recommendations at ERPC, Kolkata. In the Special meetings of PCC held on 30.12.2014, 10.04.2015 & 20.07.2015 the Protection Philosophy for Eastern Region was agreed upon which is as given below:

Sl. No.	Zone	Direction	Protected Line Reach Settings	Time Settings (in Seconds)	Remarks
1	Zone-1	Forward	80%	Instantaneous (0)	As per CEA
2a	Zone-2	Forward	For single ckt- 120 % of the protected line	0.5 to 0.6 - if Z2 reach overreaches the 50% of the shortest line. 0.35- otherwise	As per CEA
			For double ckt- 150 % of the protected line		As per CEA
2b	Zone-2 (for 220 kV and below voltage Transmission lines of utilities)	Forward	120 % of the protected line, or 100% of the protected line + 50% of the adjacent shortest line	0.35	As per CEA with minor changes
3	Zone-3	Forward	120 % of the (Protected line + Next longest line)	0.8 - 1.0	As per CEA
4	Zone-4	Reverse	10%- for long lines (for line length of 100 km and above) 20%- for shot lines (for line length of less than 100 km)	0.5	As per CEA

Note:

1) **Zone-2: - Z2 Reach should not encroach the next lower voltage level.**
2) **Zone-3: - If Z3 reach encroaches in next voltage level (after considering "in-feed"), then Z3 time must be coordinated with the fault clearing time of remote end transformer.**
3) **Zone-4: - If utility uses carrier blocking scheme, then the Z4 reach may be increased as per the requirement. It should cover the LBB of local bus bar and should be coordinated with Z2 time of all other lines.**
4) **The above settings are recommended primarily (exclusively) for uncompensated lines.**

Subsequently, all the constituents were requested to adopt the above philosophy for their inter as well as intra state lines for better protection co-ordination of their systems and Eastern Regional system as a whole. This has been implemented in the constituent's systems of ER since 2015.

5.8 ISLANDING SCHEMES

After the last major grid disturbances occurred simultaneously in NR, ER & NER on 30th & 31st July 2012, the enquiry committee constituted by MoP has made a number of recommendations in its report published on 16.08.2012. One of the recommendations (no. 9.12 of the report) suggested planning for implementation of islanding schemes.

New Islanding schemes for ER were proposed, approved & monitored by the TCC/ ERPC in its meeting. The latest status of the same are placed below:

1. Bakreswar TPS of WBPDCL – Operational w.e.f. 31.03.2015
2. Tata Power, Haldia – Operational w.e.f. 24.04.2015.
3. Farakka STPS of NTPC – Operational w.e.f. 02.04.2017
4. Bandel TPS of WBPDCL- Operational w.e.f. 15.12.2018
5. CESC as a whole Islanding Scheme, CESC-Operational
6. Chandrapura TPS of DVC – Under Implementation with CTPS-B units, NIT for the same has been floated on 25.01.2022.
7. IB TPS Islanding Scheme of OPGC- Scheme finalized. To be implemented by April, 2022.
8. Patna Islanding Scheme- Under Implementation with two units of New Nabinagar STPS (NPGCL).
9. Ranchi Islanding Scheme: Under Implementation with One unit of Tenughat TPS & Inland IPP as participating Generators.

5.9 SYSTEM (SPECIAL) PROTECTION SCHEME (SPS)

Due to enhanced complexity of electrical grid with the formation of 'NEWS' grid through addition of interconnectivity & use of high capacity transmission lines etc., System (Special) Protection Scheme (SPS) has been envisaged for safety & security of integrated grid operation. SPS is designed to detect abnormal system conditions such as outage of large generating units, high capacity corridors or HVDC interconnections. SPS preserve the integrity of electric system by using predetermined corrective measures that are simple, reliable, and safe for the system as a whole and provide acceptable system performance against all possible extreme credible contingencies. SPS has an advantage of wide-area coverage and it is pre-emptively sensing the danger in the system and takes corrective actions. SPS has also been evolved to prevent system deterioration i.e. to reduce the impact of power failure and ensure early restoration.

Eastern Region has also adopted the SPS. Presently there are 4 nos. of approved SPS in Eastern Region.

a) Tripping of Talcher - Kolar HVDC Bipole (s) - SPS at Talcher stage-II, NTPC (SPS 450 & SPS 1000)

Talcher Super thermal power station having a capacity of 3000 MW (6x500 MW) is located in Orissa of Eastern Region. The station was commissioned with 2x500 MW capacity and subsequently its second stage was commissioned, and station capacity was augmented to 3000 MW with commissioning of its further 4x 500 MW machines.

The station is the largest capacity station in the region. However, the capacity of the entire stage II (4x500 MW) was allocated to the beneficiaries of southern region.

Subsequently, 10% of the capacity was allocated to the Orissa, in Eastern region. For evacuation of Talcher STPS –II generation to Southern Region, (+/-) 500kV HVDC bipole transmission system was commissioned right up to the load centre of Southern Region at Kolar. The HVDC substation at Talcher has two pole blocks 1000 MW capacity each (subsequently augmented to 1250 MW).

The very basic design of the evacuation system of Talcher stage II to SR poses a major threat to Eastern Region and subsequently to the New Grid as any sudden forced outage of one or both the poles would mean that Eastern Grid has to initially absorb a jerk of load throw off to the tune of 1800-2000 MW. The surplus power would get wheeled through 400kV Talcher- Rourkella D/C and Rengali –Baripada-Kolaghat S/C. During monsoon as such these corridors remain heavily loaded and such contingency of pole block at Talcher would lead to a definite cascade tripping leading to isolation /possible collapse of Orissa system including TSTPP station.

In order to avoid such contingency two automatic special protection schemes were envisaged and have been implemented at Talcher Super Thermal power station. The 1st scheme as commonly known as SPS 450 was first implemented and subsequently a further improvised 2nd scheme was devised as known as SPS 1000 scheme. Both the schemes and their modalities of arming and disarming is described below:

SPS 450: This scheme was originally implemented with a view that Eastern and Western Region would absorb a jerk of 450 MW, therefore rest of the generation as available at Talcher stage II generation must be shed in order avoid a cascade tripping of the network. However, during monsoon, from Eastern Regional point of view at times absorbing even 450MW under N-1 contingency criteria of Talcher-Rourkela 400kV D/C Line becomes critical when major generation at Talcher stage II must be shed in order to avoid further criticality of the Grid. Further under any critical outage condition in the rest of the New Grid outage of HVDC bipole might pose a serious threat when it might necessitate arming of SPS 450 scheme with due coordination with NLDC. Under this mode of SPS the power injection to N-E-W grid is limited to 450 MW. The actual generation by the generators is considered for building the logic.

SPS 1000: Post formation of the NEW Grid this scheme was subsequently envisaged in order to minimize shedding of generation at Talcher STPP. The basic philosophy of this scheme is to absorb 1000MW in place of 450 MW as the Grid size increased. However, as one of the prerequisites for arming this scheme Eastern Regional operator has to ensure that sufficient evacuation margin (approx 1000 MW) is available at the AC evacuation system of TSTPP. Under this mode of SPS the power injection to N-E-W grid is limited to 1000 MW. The actual injection to the HVDC system (by measuring the flow on four a/c lines between TSTPS and Talcher HVDC station) is considered for building the logic. Under SPS 1000 scheme no generation shedding is required for a single pole tripping. For contingencies of both pole tripping and for single pole tripping with the HVDC system going to ground return mode, generation shedding will be done. Extent of generation shedding depends on the actual power flow through the HVDC link and to limit the actual injection to N-E-W grid to 1000 MW.

Further after Synchronisation of SR grid with NEW grid, it is proposed that in case of single pole or bipole outage or blocking of Talcher-Kolar HVDC sensed at Talcher HVDC terminal, a trip signal be extended to nearby generators such as Vedanta, GMR, JITPL ensuring minimum communication so that the objective of restricting injection to NEW grid to 450 MW is achieved. The reduction in generation to be achieved through these stations is 600 MW so that the injection into NEW grid is restricted to 450 MW.

In 108th OCC held on 17.04.2015 it was decided that the generation relief during HVDC Talcher-Kolar pole tripping will be shared among GMR, Vedanta & JITPL as follows: Vedanta - 200 MW, GMR-200 MW and JITPL- 200 MW.

b) Modification in Talcher-Kolar SPS in ER Region.

Background:

The SPS associated with HVDC Talcher-Kolar Bipole was implemented long back in the year 2003 as per system requirements at that time. The addition of high- capacity AC lines in the corridor parallel to this HVDC link have strengthened the ER-SR &WR-SR corridors for exchange of power to/from southern region (SR). The newly commissioned HVDC Raigarh-Pugalur Pole-I has also been commissioned recently. Presently, in cases of HVDC Talcher-Kolar Pole blocking, SPS as per design operates with load disconnection in SR and generation backing down/outage in ER. In view of strengthening of transmission system as stated above, the scheme was reviewed by NLDC in consultation with RLDC's.

It was proposed that

• GMR and JITPL thermal power plants are radially connected to 765/400 kV Angul pooling station and 765/400 kV Angul station is strongly connected to western region and southern region through765 kV lines. The tripping of HVDC Talcher-Kolar does not cause any constraint in evacuation of GMR and JITPL. Therefore, the SPS for 600 MW generation backing down at thesestations would not be required and the same may be disabled.

• It was observed that 400 kV Talcher-Meramundali D/C Lines are getting heavily loaded (beyond 874 MW) after the tripping of HVDC Talcher-Kolar in some cases. Therefore, the loading of 400 kV Talcher-Meramundali lines may also be included in the SPS logic (SPS 1000 and SPS 450) installed at Talcher STPS, NTPC.

In 175th OCC meeting held on 20.02.2021, the followings were agreed:

- To disable SPS logic for additional 600 MW generation backing down at JITPL and GMR.

- To implement revised SPS for Talcher-Kolar HVDC considering the loading of 400 kV TSTPP-Meramundali D/C line into the SPS logic.

The logic in brief is given below:

- 400 kV Talcher-Meramundali Line current logic would have three Imax settings out of which one will be active depending on the season.
- The Imax current settings have been calculated based on thermal ratings of the lines.
- This Talcher-Meramundali Current logic would be ANDed with existing TalcherKolar HVDC SPS logic.

c) SPS for Power Export to Bangladesh

As per decision of the MoP, GoI power export to Bangladesh has been explored and regular supply has been commenced from October'2013 through 400 kV Berhampur – Bheramara line with HVDC (2x500 MW) station at Bheramara (Bangladesh). 400 kV Berhampur is connected with 400 kV Farakka and Sagardighi station through 400 kV Berhampur-Farakka D/C and 400 kV Berhampur-Sagardighi D/C.

The details of SPS implemented to facilitate power transfer to Bangladesh are provided below for ready reference:

Sl. no.	Condition	Action
1	400 kV Bus Voltage at Behrampur < 390 kV	Tripping of 125 MVAR Bus Reactor at Behrampur
2	400 kV Bus Voltage at Behrampur < 380 Kv	Automatic Reduction of Behrampur HVDC setpoint to 350 MW with appropriate capacitor switching to maintain voltage at 400 kV Behermara s/s.
3	If Indian Grid Frequency is < 49.5 Hz	Automatic Reduction of Behrampur HVDC setpoint to 350 MW with appropriate capacitor switching to maintain voltage at 400 kV Behermara s/s.
4	If any circuit of 400 kV Beherampur-Behermara trips	Automatic Reduction of Behrampur HVDC setpoint to 350 MW with appropriate capacitor switching to maintain voltage at 400 kV Behermara s/s.
5	If 400 kV Sagardighi-Behrampur D/C and 400 kV Farakka-Bherampur S/C trips (Sending of CB status at Behrampur)	Total HVDC power to be ramped down to 750 MW with appropriate capacitor switching to maintain voltage at 400 kV Behermara s/s.

In order to address low Frequency, low voltage and high line loading issue in Indian Side, SPS has been envisaged to reduce the export quantum to Bangladesh.

d) SPS for 400/220 kV ICTs at Ranchi

In 106th PCC Meeting held on 16.09.2021, It was informed that special meetings were held on 01st Sep 2021 and 06th Sep 2021 among DVC, JUSNL, Powergrid, ERLDC & ERPC secretariat and an SPS was finalized for ensuring N-1 reliability criteria of 400/200 kV ICTS at Ranchi.

The SPS in brief is as follows:

Stage1- For 100% load in ICT-1 or ICT 2, SPS issues trip command to 220 kV Ranchi-Ramgarh line after 300 Seconds delay

Stage2- For 130% load in ICT-1 or ICT 2, SPS issues trip command to 220 kV Ranchi-Ramgarh line after 5 Sec delay

Powergrid vide email dated 24.09.2021 communicated that SPS scheme for Ranchi ICT has been implemented and tested successfully and is in operation since 24.09.2021.

5.11 SCADA DATA

For effective management and monitoring of the grid parameters availability of various live data viz generation of power stations, line flows and voltages at important sub-stations are the vital inputs to the grid operators. All the required data should be made available on real time basis in the control room through SCADA system. OCC/TCC advised all constituents to do the needful for restoration of SCADA data at the earliest and the status of availability of SCADA data are monitored regularly by the OCC/SCADA O&M meetings. Apart from the concerned utility, CTU/Powergrid plays a major role in availability of the SCADA data as installation of RTU are done by them.

CHAPTER-6

MEETINGS, REPORTS, CERTIFICATION AND WORKSHOP

6.1 MEETINGS HELD DURING 2021-22

In order to discharge various duties entrusted to ERPC as per Indian Electricity Act, 2003 and IEGC, various meetings were organised during 2021-22 and detail of meetings are given at **Annexure-XXIII**.

6.2 REPORTS ISSUED

ERPC has been issuing various reports regarding system operational data, load generation balance data, system studies data, etc. The details of various reports issued during 2021-22 by ERPC are given below:

- Monthly Progress Reports
- Monthly Power Supply Position Reports
- Load Generation Balance Report for the year 2022-23
- Annual Report for the year 2020-21

6.3 CERTIFICATION OF TRANSMISSION AVAILABILITY

In line with CERC order, ERPC Secretariat has certified availability of transmission system for the year 2021-22.

6.4 TRAINING / WORKSHOP HELD

As a follow-up of one of the recommendations of Enquiry Committee headed by Chairperson, CEA on grid disturbances that took place in India on 30th & 31st July'2012, Ministry of Power constituted a "Task Force on Power System Analysis and Contingencies". The Task Force strongly recommended for training in protection related issues.

CHAPTER-7

IMPORTANT DECISIONS TAKEN IN VARIOUS MEETINGS OF ERPC DURING 2021-22

1. ***Issue: Technical minimum schedule support to ISGS plants of Eastern Region by availing URS power of surrendered beneficiaries***

As per CERC Order on Petition No: 60/MP/2019, the practice of jacking up surrendered schedule of beneficiaries shall be withdrawn, except in cases as mandated in Section 5.7 of detailed Reserve Shutdown Procedure (RSD) (CERC Order No. - L-1/219/2017- CERC), which states:

Quote

RLDC shall Suo-moto revise the schedule of any generating station as per clauses 6.5.14 and 6.5.20 of the Grid Code to operate at or above technical minimum in the ratio of under-requisitioned quantum (with respect to technical minimum) in the interest of smooth system operation under the following conditions:

- *Extreme variation in Weather Conditions*
- *High Load Forecast*
- *To maintain reserves on regional or all India basis*
- *Network Congestion*
- *Any other event which in the opinion of RLDC/NLDC shall affect the grid security.*

While doing so, it is possible that the requisition of some beneficiaries may go up to ensure technical minimum. In this case, SLDCs may surrender power from some other inter-State generating station(s) or intra-State generating station(s) based on merit order. The concerned RLDC shall issue R-1 schedule accordingly and this shall be intimated to the concerned generating station, through the scheduling process."

Unquote.

In the special meeting dated 30.12.2021, after detailed deliberation the followings were decided:

1. A working Committee may be formed consisting of the representatives from West Bengal, Odisha, Bihar, NTPC, ERLDC and ERPC for detailed study of the methodology devised in Western Region and formulation of similar methodology pertaining to Eastern Region.
2. A mutual agreement may be worked out in which the beneficiary(s) who are ready to avail the URS power to keep the generator on bar, may be incentivised by waiving off the fixed charges up to the technical minimum schedule.
3. Beneficiaries to bear a certain percentage (e.g. 100%, 75%, 50%, 0% etc) of fixed charge (FC) of the URS availed by the availing beneficiary/beneficiaries up to the technical minimum. This FC waive off % to be finalized by the beneficiaries.

In the Working Committee meeting dated 10.02.2022, West Bengal, Odisha, Bihar agreed for 100% FC waive off and DVC agreed for 50% FC waive off.

In 45th TCC meeting, all the beneficiaries have agreed for 100% Fixed Cost waive off and requested NTPC to implement the scheme at the earliest. NTPC agreed on implementing the scheme by 14th April 2022 as per the timelines finalized in the 45th TCC meeting.

West Bengal representative submitted a query on inclusion of beneficiaries of other regions in the scheme as decided in the working committee. ERPC representative submitted that the above issue was highlighted in the NPC meeting held on 28th February 2022 wherein it was decided to take prior approval from CERC for the inclusion of inter-regional beneficiaries in the scheme.

Odisha representative submitted that a letter addressing the issue of inclusion of inter-regional beneficiaries has been written to MoP.

Decision:
ERPC commended the beneficiaries for their willingness to waive off 100% Fixed Cost and approved the scheme. It was further concluded that as of now the scheme may be implemented considering the ER beneficiaries only.

2. Issue : Constitution of Transmission Planning Sub-Committee of ERPC.

MoP vide office order dated 21.10.2021 had dissolved the Regional Power Committee (Transmission Planning) for all the region and decided that regional level consultation of ISTS planning will be done in regional power committees.

As per the electricity act 2003, CTU and ER STUs have to prepare the plan in coordination with ERPC. Further RPC has to facilitate the planning of inter as well as intra state transmission plans with ER STUs and CTU. Some of the state regulations and grid code also reiterates the same and requires the feedback and suggestion of ERPC to be included during transmission plan submission by ER STUs to their respective regulators.

In view of above, it was proposed to constitute a sub-committee on transmission planning to provide appropriate consultation on transmission planning, facilitating coordination between CTU and STU including consideration of operational feedback of SLDC and ERLDC during coordinated planning and coordination between different ER STUs.

In 45th TCC Meeting, it was decided to constitute a planning sub-committee with members from each of the state transmission utilities, SLDCs, DVC, ERLDC & ERPC Secretariat.

The scope of the committee would be to study and give suggestions on the intra-state transmission planning proposals submitted by the state transmission utilities including DVC before the committee.

Decision:
ERPC approved the proposal of TCC to constitute a planning sub-committee with members from each of the state transmission utilities, SLDCs, DVC, ERLDC & ERPC Secretariat to study and give suggestions on the intra-state transmission planning proposals (within the command area of respective transmission utility) and requested all the concerned utilities to nominate their representative by 7th April 2022.

अध्याय–8

पूर्वी क्षेत्रीय विद्युत समिति में राजभाषा नीति का कार्यान्वयन

वर्ष 2021-22 के दौरान पूर्वी क्षेत्रीय विद्युत समिति में राजभाषा नीति के अनुपालन में निम्नलिखित कार्य किये गए है :

8.1 हिन्दी पत्राचार

- राजभाषा अधिनियम के नियम-5 के अनुपालन में, हिन्दी में प्राप्त पत्रों के उत्तर हिन्दी में ही दिए जाते हैं |

- ओ.सी.सी., प्रोटेक्शन उप समिति, वाणिज्यिक उप-समिति, तकनीकी समन्वय उप-समिति और ई.आर.पी.सी. की बैठकों के कार्यवृत्त एवं कार्यवाही के अग्रेषण पत्र को द्विभाषी रूप में जारी किये गए |

8.2 राजभाषा कार्यान्वयन समिति की बैठकें

राजभाषा नीति के अनुसार वर्ष **2021-22** में राजभाषा कार्यान्वयन समिति की बैठकें प्रत्येक तिमाही में दिनांक :30/06/2021,02/08/2021, 17/12/2021 तथा 04/03/2022 क्रमशः कुल चार बैठकें का आयोजन किया गया था | इन बैठकों में गृह मंत्रालय, राजभाषा विभाग से प्राप्त हिन्दी के प्रगामी प्रयोग से संबंधित तिमाही प्रगति रिपोर्ट की समीक्षा पर चर्चा की गई, कार्यालय में हिंदी के प्रयोग को बढ़ने से संबंधित निर्णय लिए गए,वार्षिक कार्यक्रम को लेकर चर्चा एवं तदनुसार निर्णय लिए गए |

8.3 कार्यशाला का आयोजन

वर्ष **2021-22** में 13/09/2021, 31/12/2021 एवं 08/03/2022 को हिन्दी कार्यशाला आयोजित किये गए | कार्यालय में राजभाषा कार्यान्वयन के अनुपालन पर कार्मिकों को हिन्दी में दिन-प्रतिदिन के कार्यालय कार्य करने की झिझक दूर करना और हिन्दी में काम करना आसान बनाने हेतु विभिन्न विषयों पर चर्चा करने के लिए कार्यशाला आयोजित किया जाता है |

8.4 प्रोत्साहन योजना

हिन्दी के प्रयोग को बढ़ावा देने एवं हिन्दी में काम करने के लिए प्रोत्साहित करने हेतु, इस कार्यालय में सरकारी नियमानुसार विभिन्न प्रकार के प्रोत्साहित योजना लागू है | हिन्दी में टिप्पण-आलेखन करना एवं कंप्यूटर पर हिन्दी में टंकन का काम करने के लिए प्रोत्साहित योजना लागू है |

8.5 हिन्दी दिवस / हिन्दी सप्ताह / हिन्दी पखवाड़ा का आयोजन

दिनांक:-13-09-2021 से 17-09-2021 के दौरान इस कार्यालय में हिन्दी सप्ताह मनाया गया | इस दौरान विभिन्न प्रकार की कुल 05 प्रतियोगिताएँ आयोजित किया गया था जिसमें कार्यालय के सभी अधिकारियों और कर्मचारियों ने बड़े उत्साह के साथ भाग लिया | सफल प्रतिभागियों को प्रथम, द्वितीय एवं तृतीय पुरस्कार प्रदान किया गया एवं भाग लेने वाले सभी प्रतिभागियों को प्रतिभागिता पुरस्कार प्रदान किया गया |

8.6 राजभाषा कार्यान्वयन से संबंधित अन्य कार्य

- हिन्दी के प्रगामी प्रयोग से संबंधित तिमाही एवं अर्ध-वार्षिक प्रगति रिपोर्ट नियमित रूप से मुख्यालय, के.वी.प्राधिकरण, नई दिल्ली एवं राजभाषा विभाग के क्षेत्रीय कार्यालय, कोलकाता को प्रेषित किया गया |

- सेवा पुस्तिकाओं में प्रविष्टियाँ ज्यादा से ज्यादा हिन्दी में किये गए |

- कार्यालय में नियमित रूप से उपयोग होने वाले मानकीकृत प्रपत्र को द्विभाषी रूप में इस्तेमाल किया जाता है |

- इन्टरनेट पर उपलब्ध विभिन्न प्रकार के हिन्दी साफ्टवेयरों का इस्तेमाल करके कार्यालय में कंप्यूटर पर सभी अधिकारी एवं कर्मचारी आवश्यकता के अनुसार काम करते हैं |

- वर्ष के दौरान कार्यालय में प्रत्येक तिमाही में सदस्य सचिव की अध्यक्षता में एक कार्यशाला आयोजित किया जाता है। जिसमें कार्यालयों के दैनिक कामकाज में हिंदी के प्रयोग को बढ़ने के बारें में समीक्षा किया गया और कार्यालयों के दैनिक कामकाज में अधिक से अधिक सरल और सहज हिन्दी का प्रयोग के लिए निर्णय लिया गया |

- दिनांक- 13/09/2021 को आयोजित हिंदी कार्यशाला में अतिथि वक्ता डॉ ,प्राध्यापिका ,इतु सिंह .**खिदिरपुर कॉलेज, कोलकाता** को कार्यशाला का विषय-**" हिंदी सहित्य एवं उनके प्रसिद्ध कवि तथा उनकी कविताएँ"** पर व्याख्यान हेतु आमंत्रित किया गया था इतु सिंह .डॉ। द्वारा उक्त विषय पर बहुमूल्य ज्ञान प्रदान किया गया, उन्होंने power point presentation के माध्यम से हिंदी साहित्यकार, उसके प्रसिद्ध कवियों एवं उनकी कविताओं पर प्रकाश डाला। उन्होंने आदिकाल से आधुनिक काल तक समस्त कवियों का जीवन परिचय देते हुए उनके कुछ विश्व प्रसिद्ध कविताओं का पाठ भी किया, PPT के माध्यम से उनकी कविताओं को प्रस्तुत किया साथ ही कविताओं के आंतरिक अर्थ पर भी प्रकाश डाला।

- दिनांक- 31/12/2021 को आयोजित हिंदी कार्यशाला में अतिथि वक्ता डॉ.आनंद श्रीवास्तव को कार्यशाला का विषय **हिंदी सहित्य एव"ं मनोरंजन "**पर व्याख्यान हेतु आमंत्रित किया गया था ।डॉ.आनंद श्रीवास्तव द्वारा उक्त विषय पर बहुमूल्य ज्ञान प्रदान किया गया power point presentation उन्होंने , रीतिकाल एवं आधुनिक ,भक्तिकाल ,हिंदी के आदिकाल ,के माध्यम से हिंदी सहित्य का परिचय देते हुए इसके साथ ही उन्होंने । काल के प्रसिद्ध कवियों एवं उनकी कविताओं पर प्रकाश डालाहिंदी उपन्यास , कहानियों पर भी प्रकाश डाला साथ ही हमें यह जानकारी दी कि कैसे फ़िल्म जगत भी ,नुक्कड़ नाटक ,जाने कितने ही हिंदी फ़िल्म की कहानियां हिंदी सहित्य के उपन्यास । हिंदी सहित्य से प्रभावित होता है उन्होंने आदिकाल से आधुनिक क । नाटक आदि से ली गयी है◌ाल तक के प्रसिद्ध कवियों उपन्यासकार , ,का जीवन परिचय देते हुए उनके कुछ विश्व प्रसिद्ध कविताओं का पाठ भी कियाPPT के माध्यम से उनकी कविताओं को प्रस्तुत किया साथ ही कविताओं के आंतरिक अर्थ पर भी प्रकाश डाला ।

- दिनांक- 08/03/2022 को आयोजित हिंदी कार्यशाला में अतिथि वक्ता डॉ ,प्राध्यापिका ,इतु सिंह . **खिदिरपुर कॉलेज, कोलकाता** को कार्यशाला का विषय-**"हिंदी सहित्य में स्त्री चेतना का स्वर"** पर व्याख्यान हेतु आमंत्रित किया गया था ।डॉ. **इतु,** द्वारा उक्त विषय पर बहुमूल्य ज्ञान प्रदान किया गया, उन्होंने power point presentation के माध्यम से हिंदी सहित्य में स्त्री लेखिका एवं कवयित्री की रचनाओं तथा कविताओं पर प्रकाश डाला। उन्होंने आदिकाल से आधुनिक काल तक के समस्त रचनाकार जिन्होंने स्त्री चेतना के संबंध में अपना पक्ष रखा है, उन सबका विस्तार से चर्चा किया एवं उनके कुछ विश्व प्रसिद्ध कविताओं का पाठ भी किया, PPT के माध्यम से उनकी कविताओं को प्रस्तुत किया साथ ही कविताओं के आंतरिक अर्थ पर भी प्रकाश डाला । कार्यशाला के दौरान बीच–बीच में उपस्थित कार्मिकों से मौखिक रूप से प्रश्न-उत्तर भी किया, जो उपस्थित सभी कार्मिकों के लिए ज्ञानवर्धक रहा।

इस कार्यालय में राजभाषा नीति और नियमों के उपबंधो के अधीन जारी किए गए निदेशों का समुचित रूप से अनुपालन तथा गृह मंत्रालय, राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम में निर्धारित लक्ष्यों की प्राप्ति के लिए हर संभव प्रयास जारी है |

ANNEXURE-I

Manpower Strength of ERPC Secretariat

The status of posts of various grades at ERPC Secretariat (**as on 31st March, 2022)** is given below:

POST	SANCTIONED	FILLED	VACANT
GAZETTED			
Member Secretary	1	1	0
Superintending Engineer/Director	3	2	1
Executive Engineer	4	2	2
Assistant Executive Engineer/AD-I	4	2	2
Assistant Engineer/ AD-II	2	2	0
Private Secretary	1	0	1
NON-GAZETTED			
Draftsman Gr. II	1	0	1
Head Clerk	1	1	0
J. T. O	1	1	0
Stenographer Gr. I	1	0	1
Stenographer Gr. II	1	0	1
Electrician	2	0	2
Upper Division Clerk	3	1	2
Lower Division Clerk	3	1	2
Driver	2	1	1
MTS	6	4	2
TOTAL	**36**	**18**	**18**

Chairpersons / Chairmen of Eastern Regional Power Committee (ERPC) & Erstwhile Eastern Regional Electricity Board (EREB) Since its Inception

Period	Constituent	Name of the Chairmen/Chairpersons
01.06.65 to 31.05.66	BSEB	Sh. R.S. Mishra, IAS Sh. R. Prasad, IAS
01.06.66 to 31.05.67	DVC	Sh. T. Sivasankara, ICS
01.06.67 to 31.05.68	OSEB	Sh. V.V. Ananthakrishnan, IAS
01.06.68 to 31.05.69	WBSEB	Sh. Dutta Mazumdar, IAS
01.06.69 to 31.05.70	BSEB	Sh. H.N. Thakur, IAS
01.06.70 to 31.05.71	DVC	Sh. N.E.S. Raghavachari, ICS
01.06.71 to 31.05.72	OSEB	Sh. A.K. Mazumdar, IAS Sh. A.C. Bandyopadhyay, IAS
01.06.72 to 31.05.73	WBSEB	Sh. S.K. Mukherjee, IAS Sh. J.C. Talukdar, IAS
01.06.73 to 31.05.74	BSEB	Sh. B. N. Ojha .
01.06.74 to 31.05.75	DVC	Sh. S.J. Majumdar, ICS Lt. Gen. P.S. Bhagat, VC, PVSM
01.06.75 to 31.05.76	OSEB	Sh. K.C. Gantayet
01.06.76 to 31.05.77	WBSEB	Brig. D.N. Mallick
01.06.77 to 31.05.78	BSEB	Sh. K.P. Sinha, IAS Sh. J.D. Sahay Brig. S.P. Kochar
01.06.78 to 31.05.79	DVC	Sh. A.C. Bandyopadhyay, IAS
01.06.79 to 31.05.80	OSEB	Sh. J.M. Patnaik Sh. B.N. Dash
01.06.80 to 31.05.81	WBSEB	Sh. N.C. Basu
01.06.81 to 31.05.82	BSEB	Sh. Z.S. Haque Sh. S.K. Chaturvedi, IAS Sh. R.P. Khanna, IAS
01.06.82 to 31.05.83	DVC	Sh. P.C. Luthar
01.06.83 to 31.05.84	OSEB	Sh. A. Panda Sh. S.K.Nanda
01.06.84 to 31.05.85	WBSEB	Sh. A. Ghatak
01.06.85 to 31.05.86	BSEB	Sh. S. Kumar Sh. I.C. Kumar, IAS
01.06.86 to 31.05.87	DVC	Lt. Gen. M.M.L. Ghai, PVSM Sh. A. Ghatak
01.06.87 to 31.05.88	OSEB	Sh. P.K. Kar
01.06.88 to 31.05.89	WBSEB	Dr. B.P. Banerjee Dr. D.K. Bose, (from 1.5.89)
01.06.89 to 31.05.90	BSEB	Sh. J.C. Jetli, IAS Sh. J.C. Kundra (from 26.12.89) Sh. P.K. Misra (from 3.4.90)
01.06.90 to 31.05.91	DVC	Sh. P.K. Sarkar, IAS
01.06.91 to 31.05.92	OSEB	Sh. K.C. Mahapatra Sh. S.K. Mahapatra (from 22.12.91)

Period	Constituent	Name of the Chairmen/Chairpersons
01.06.92 to 31.05.93	WBSEB	Sh. D.K. Bose Sh. S.K. Dasgupta
01.06.93 to 31.05.94	BSEB	Sh. B. Prasad
01.06.94 to 31.05.95	DVC	Sh.Maj.Gen. Sharad Gupta,V.S.M Sh. A.K. Misra, IAS (from 1.5.95)
01.06.95 to 31.05.96	OSEB	Sh. M.Y. Rao, IAS
01.06.96 to 31.05.97	WBSEB	Sh. S.R. Sikdar
01.06.97 to 31.05.98	BSEB	Sh. R.P. Yadav Sh. A.K. Upadhyay (from 18.5.98)
01.06.98 to 31.05.99	DVC	Sh. A.K. Misra, IAS
01.06.99 to 31.05.00	GRIDCO	Sh. B.C. Jena
01.06.00 to 31.05.01	WBSEB	Dr. G.D. Gautama, IAS
01.06.01 to 31.05.02	BSEB	Sh. C.M. Jha, IAS Sh. N.K. Agrawal (from 22.10.01)
01.06.02 to 31.05.03	DVC	Sh. J.C. Jetli, IAS
01.06.03 to 31.05.04	GRIDCO	Sh. S.C. Mahapatra, IAS
01.06.04 to 31.05.05	JSEB	Sh. B.K. Chauhan Dr. H.B. Lal (from 18.10.2004)
01.06.05 to 31.03.06	WBSEB	Sh. M. K. De, IAS
01.04.06 to 31.03.07	BSEB	Sh. M. M. Singh, IAS Sh. Swapan Mukherjee (from 01.03.07)
01.04.07 to 31.03.08	JSEB	Sh. V. N. Pandey Sh. B. M. Verma (from 29.12.07)
01.04.08 to 31.03.09	OPTCL & GRIDCO	Sh. C.J.Venugopal, IAS
01.04.09 to 31.03.10	Energy and Power Deptt., Govt. of Sikkim	Sh. Pema Wangchen
01.04.10 to 31.03.11	WBSEDCL & WBSETCL	Sh. M. K. De, IAS
01.04.11 to 31.03.12	BSEB	Sh. P. K. Rai
01.04.12 to 31.03.13	JSEB	Sh. S. N. Verma
01.04.13 to 15.07.13 16.07.13 to 31.03.14	OPTCL & GRIDCO	Sh. P. K. Jena, IAS Sh. Hemant Sharma, IAS (from 16.07.13)
01.04.14 to 31.03.15 01.04.15 to 05.07.15	Energy and Power Deptt., Govt.of Sikkim	Sh. P. B. Subba, Principal Chief Engr.-cum-Secretary Shri N. T. Bhutia, Principal Chief Engr.-cum-Secretary (w.e.f. 1.4.15 to 5.7.15)
06.07.15 to 03.01.16 04.01.16 to 31.03.16	WBSEDCL	Shri Narayan Swaroop Nigam, IAS Shri Rajesh Pandey, IAS (from 04.01.16)
01.04.16 to 31.03.17	BSPHCL	Shri Prataya Amrit, IAS
01.04.17 to 31.03.18	JUVNL	Shri N.M.Kulkarni, IAS
01.04.18 to 31.03.19	OPTCL & GRIDCO	Shri Hemant Sharma, IAS
01.04.19 to 31.10.19	Energy and Power Deptt., Govt.of Sikkim	Shri K. B. Kunwar, Principal Chief Engineer-cum-Secretary
01.11.19 to 31.03.20	Energy and Power Deptt., Govt.of Sikkim	Shri A B. Rai, Principal Chief Engineer-cum-Secretary
01.04.20 to 31.03.21	WBSEDCL	Shri Santanu Basu, IAS
01.04.21 to 31.03.22	BSPHCL	Shri. Sanjeev Hans, IAS

ANNEXURE-III

Member Secretaries of Eastern Regional Power Committee (ERPC) & Erstwhile Eastern Regional Electricity Board (EREB) since its Inception

Sl.	Name	From	To
1	Sh. Z.S. Haque	1964	1965
2	Sh. G. Mukherjee	1965	1967
3	Sh. B. Choudhury	1971	1977
4	Sh. M.M. Turabi (I/C)	1977	1978
5	Sh. B.C. Ghosh (I/C)	06.03.1978	06.04.1982
6	Sh. U.V. Senoy	08.04.1982	31.08.1982
7	Sh. B.C. Ghosh (I/C)	06.09.1982	12.12.1982
8	Sh. P.K. Kar	13.12.1982	15.10.1985
9	Sh. B.C. Ghosh (I/C)	16.10.1985	01.12.1987
10	Sh. B.C. Ghosh	31.12.1987	09.03.1988
11	Sh. B. Sengupta (I/C)	28.03.1988	26.03.1989
12	Sh. B. Sengupta	27.03.1989	31.05.1993
13	Sh. A. Roy(I/C)	01.06.1993	17.07.1993
14	Dr. S. Mukhopadhyay	18.07.1993	03.08.1995
15	Sh. P. Ray (I/C)	04.08.1995	04.02.1996
16	Sh. S. Santhanam	05.02.1996	16.08.1996
17	Sh. P. Ray (I/C)	17.08.1996	26.11.1997
18	Sh. V.S. Verma	27.11.1997	30.07.1998
19	Sh. P. Ray (I/C)	30.07.1998	06.07.1999
20	Sh. B.K. Mishra	07.07.1999	28.11.2003
21	Sh. R.B. Sharma	27.11.2003	31.01.2005
22	Sh. M.K. Mitra (I/C)	01.02.2005	05.12.2005
23	Sh. M.K. Mitra	06.12.2005	31.03.2006
24	Sh. K. N. Garg (I/C)	01.04.2006	30.04.2006
25	Sh. Raffi-ud-din	01.05.2006	10.09.2006
26	Sh. R. K. Grover	11.09.2006	17.09.2009
27	Sh. A. K. Rampal	18.09.2009	06.09.2011
28	Sh. A. K. Bandyopadhyaya (I/C)	07.09.2011	30.09.2014
29	Sh. A. K. Bandyopadhyaya	01.10.2014	31.10.2017
30	Sh. J. Bandyopadhyay	01.11.2017	22.05.2020
31	Sh. N. S. Mondal	09.09.2020	Contd.

INSTALLED AND EFFECTIVE CAPACITY OF POWER STATIONS
IN THE EASTERN REGION AS ON 31.03.2022

SL. N0.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			PRESENT CAPACITY (AFTER DERATION)	EFFECTIVE CAPACITY
		NO. & CAPACITY OF UNITS 31.03.2021	Commissioned(+)/ De-commissioned(-) 2021-22	TOTAL	(MW) AS ON 31.03.2022	(MW) AS ON 31.03.2022
I	**BSPGCL+BSPHCL**					
	THERMAL:					
2	NTPC MUZAFFARPUR TPS Stg.I	2x110	-220	0	0	0
	SUB TOTAL (THERMAL)	**220**	**-220**	**0**	**0**	**0**
3	**RES**	**354.91**	**32.44**	**387.35**	**387.35**	**387.35**
	TOTAL (TH+HY) (BSPHCL)	**574.91**	**-187.56**	**387.35**	**387.35**	**387.35**
II	**JUSNL**					
4	TENUGHAT TPS (THERMAL)	2x210		420	2x210	420
	SUB TOTAL (THERMAL)	**420**		**420**	**420**	**420**
5	SUBERNREKHA (HYDRO)	2x65		130	2x65	130
	SUB TOTAL(HYDRO)	**130**		**130**	**130**	**130**
6	**RES**	**60.41**	**36.73**	**97.14**	**97.14**	**97.14**
	TOTAL (HY+RES) (JUVNL)	**610.41**	**36.73**	**647.14**	**647.14**	**647.14**
III	**D V C**					
	THERMAL :					
7	BOKARO "B" TPS (U-3)	1x210	-210	0	0	0
8	CHANDRAPURA TPS (U#7&8)	2x250		500	2x250	500
9	DURGAPUR TPS/ WARIA(U#4)	1x210		210	1x210	210
10	MEJIA TPS(U#1-4, 5-6, 7-8)	4x210+2x250+2x500		2340	4x210+2x250+2x500	2340
11	DURGAPUR STEEL TPS (U#1 & 2))	2x500		1000	2x500	1000
12	KODERMA STPS (U# 1& 2)	2x500		1000	2x500	1000
13	RAGHUNATHPUR TPS (U# 1&2)	2x600		1200	2x600	1200
14	BOKARO "A" TPS (U#1)	500		500	1x500	500
	SUB TOTAL (THERMAL)	**6960**	**-210**	**6750**	**6750**	**6750**
	HYDRO					
15	MAITHON	2x20+1x23.2		63.2	2x20+1x23.2	63.2
16	PANCHET	2x40		80	2x40	80
17	TILAIYA	2x2		4	2x2	4
	SUB TOTAL(HYDRO)	**147.2**		**147.2**	**147.2**	**147.2**
	TOTAL (TH+HY) (DVC)	**7107.2**	**-210**	**6897.2**	**6897.2**	**6897.2**

Patratu #1,2,3,5 &8 retired on 21.12.2016 . Patratu #4,6,7,9 &10 Phase out during 2017-18.

DVC, DTPS U#3(140 MW) decommissioned on 10.03.2016

DVC, CTPS U#1 (140 MW) decommissioned on 13.01.2017 , CTPS U#2(140 MW) on 30.07.2017& CTPS U#3(140 MW) on 19.03.2020 respectively.

DVC, BTPS-B U#1&2(2X210 MW) each decommissioned on 30.07.2017

DVC, BTPS-B U-3 (210 MW) decommissioned on 01.04.2021.

KBUNL, Muzaffarpur TPS U-1 & 2, each 110 MW decomissioned on 08.09.2021.

SL. N0.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			PRESENT CAPACITY (AFTER DERATION)	EFFECTIVE CAPACITY
		NO. & CAPACITY OF UNITS 31.03.2021	Commissioned(+)/ De-commissioned(-) 2021-22	TOTAL	(MW) AS ON 31.03.2022	(MW) AS ON 31.03.2022
IV	**ODISHA**					
	THERMAL					
18	NTPC TALCHER TPS	4x62.5+2x110	-470	0	0	0
19	IB TPS STG-I	2x210		420	2x210	420
20	IB TPS STG-II	2x660		1320	2x660	1320
	SUB TOTAL (THERMAL)	**2210**	**-470**	**1740**	**1740**	**1740**
	HYDRO (OHPC)					
21	BURLA (Hirakud-I)	2x49.5+2x32+3x37.5	12.3	287.8	2x49.5+2x32+3x43.65	287.8
22	CHIPLIMA (Hirakud-II)	3x24		72	3x24	72
23	BALIMELA	6x60+2x75		510	6x60+2x75	510
24	RENGALI	5x50		250	5x50	250
25	UPPER KOLAB	4x80		320	4x80	320
26	INDRAVATI	4x150		600	4x150	600
27	MACHKUND (Odisha Share)	57.38		57.38	57.38	57.38
	SUB TOTAL (HYDRO)	**2084.88**	**12.3**	**2097.18**	**2097.18**	**2097.18**
	RES	**539.57**	**67.52**	**607.09**	**607.09**	**607.09**
	TOTAL (TH+HY+RES) (ODISHA)	**4834.45**	**-390.18**	**4444.3**	**4444.3**	**4444.3**
V	**WBPDCL**					
	THERMAL					
28	BANDEL @	2x82.5+1x215	-82.5	297.5	1x60+1x215	275
29	SANTALDIH (U#5&6)	2x250		500	2x250	500
30	KOLAGHAT	6x210	-420	840	4x210	840
31	BAKRESHWAR	5x210		1050	5x210	1050
32	SAGARDIGHI (U# 1,2,3&4)	2x300+2x500		1600	2x300+2x500	1600
33	DPPS (U#7,8)	1x300+1x250		550	1x300+1x250	550
	SUB-TOTAL THERMAL(WBPDCL)	**5340**	**-502.5**	**4837.5**	**4815**	**4815**
VI	**WBSEDCL**					
34	JALDHAKA-I	3x9		27	3x9	27
35	JALDHAKA-II	2x4		8	2x4	8
36	RAMAM HYDEL	4x12.73		50.92	4x12.73	50.92
37	TEESTA CANAL FALLS	9x7.5		67.5	9x7.5	67.5
38	PURULIA PUMP STORAGE	4x225		900	4x225	900
	SUB-TOTAL HYDRO (WBSEDCL)	**1053.42**		**1053.42**	**1053.42**	**1053.42**
39	**RES**	**500.76**	**86.19**	**586.95**	**586.95**	**586.95**
	TOTAL (TH+HY+RES) (WB)	**6894.18**	**-416.31**	**6477.87**	**6455.37**	**6455.37**

WBPDCL, Bandel TPS U#3&4 (2X82.5 MW) each decommissioned in the month of April-2018
NTPC, TTPS U-1 to U-6 (4x62.5+2x110) have been decommissioned on 01.04.2021.
WBPDCL, Bandel TPS U-1 (82.5 MW) has been decommissioned on 21.02.2022.
WBPDCL, Kolaghat TPS U-1 & U-2, each of capacity 210 MW, have been decommissioned on 21.02.2022.

SL. NO.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			PRESENT CAPACITY (AFTER DERATION)	EFFECTIVE CAPACITY
		NO & CAPACITY OF UNITS 31.03.2021	Commissioned(+)/ De-commissioned(-) 2021-22	TOTAL	(MW) AS ON 31.03.2022	(MW) AS ON 31.03.2022
VII	CESC THERMAL					
40	SOUTHERN	2x67.5		135	135	135
41	TITAGARH	4x60		240	240	240
42	BUDGE BUDGE	3x250		750	750	750
	TOTAL (CESC)	**1125**		**1125**	**1125**	**1125**
43	**HALDIA ENERGY LTD. (HEL)(2X300 MW)**	**600**		**600**	**600**	**600**
IX	**SIKKIM**					
44	**RES**	**52.18**	**4.61**	**56.79**	**56.79**	**56.79**
	TOTAL (SIKKIM)	**52.18**	**4.61**	**56.79**	**56.79**	**56.79**
X	**NTPC**					
45	FARAKKA STPS - I&II	3x200+2x500		1600	3x200+2x500	1600
46	FARAKKA STPS - III (U# 6)	1x500		500	1x500	500
47	KAHALGAON STPS - I&II	4x210+3x500		2340	4x210+3x500	2340
48	TALCHER STPS - I	2x500		1000	2x500	1000
49	BARH Stg-II (U# 4&5)	2x660		1320	2x660	1320
50	BARH Stg-I (U#1)	0	660	660	1x660	660
51	MTPS Stg-II	2X195		390	2X195	390
52	BRBCL,Nabi Nagar TPS	3X250	250	1000	4X250	1000
53	NPGCL,NSTPP	1x660	660	1320	2X660	1320
54	NTPC, Darlipali STPP	1x800	800	1600	2X800	1600
	NTPC, Barauni TPS	2x110+1x250	250	720	2x105+2x250	710
	TOTAL (NTPC)	**9830**	**2620**	**12450**	**12440**	**12440**
	NTPC TALCHER SOLAR	**10**		**10**	**10**	**10**
XI	**NHPC**					
55	RANGIT HPS	3x20		60	3x20	60
56	TEESTA HPS	3x170		510	3x170	510
57	TLDP-III*	4x33		132	4x33	132
58	TLDP-IV*	4x40		160	4x40	160
	TOTAL	**862**		**862**	**862**	**862**
XII	**IPP**					
59	MPL (Thermal U#1,2)	2x525		1050	2x525	1050
60	APNRL (Thermal U# 1,2)	2x270		540	2x270	540
61	GMR (Thermal U# 1&2)	2x350		700	2x350	700
62	JITPL(Thermal U# 1,2)	2x600		1200	2x600	1200
	Sterlite Power Station (U#2)	1x600		600	1x600	600
	Jojobera Thermal Power Plant	2x120		240	240	240
	TOTAL IPP (THERMAL)	**4330**		**4330**	**4330**	**4330**
63	CHUZACHEN (Hydro U#1,2)	2x55		110	2x55	110
64	JORETHANG(Hydro U#1,2)	2x48		96	2x48	96
65	TEESTA URJA St III (6x200)	6x200		1200	6x200	1200
66	DICKCHU HEP(2x 48)	2x48		96	2x48	96
67	TASHIDING(2x 48.5)	2x48.5		97	2x48.5	97
68	RONGNICHU HEP (2x56.5)	0	113	113	2x56.5	113
	TOTAL IPP (HYDRO)	**1599**	**113**	**1712**	**1712**	**1712**
XIV	**BHUTAN IMPORT ****					
69	CHPS	4x90		360	4x90	360
70	KURICHHU HPS	4x15		60	4x15	60
71	TALA HPS	6x170		1020	6x170	1020
72	DAGHACHU	2x63		126	2x63	126
73	MANGDECHHU HEP	4x180		720	4x180	720
	TOTAL BHUTAN IMPORT	**2286**		**2286**	**2286**	**2286**
XV	**EASTERN REGION(Excluding Bhutan import)**					
	THERMAL	**31035**	**1437.5**	**32253**	**32220**	**32220**
	HYDRO	**5877**	**125**	**6002**	**6002**	**6002**
	SOLAR (RES)	**1518**	**227.5**	**1745**	**1745**	**1745**
	ER GRAND TOTAL (Excl. Bhutan)	**38429**	**1790**	**40000**	**39967**	**39967**

*100% power of TLDP-III & IV under NHPC is allocated for West Bengal.

** Allocated import by ER from Bhutan (90 MW of Chukha power is for own consumption of Bhutan & 15% of Tala power allocated to NR)

TSTPS Stage-II (4x500 MW) of NTPC though geographically situated in Orissa but it is meant for SR, hence not considered for I.C. of ER.

NTPC, Darlipali STPS U-2 (800 MW) has been commissioned on 01.09.2021.

NPGCL, New Nabinagar STPS U-2 (660 MW) has been commissioned on 23.07.2021.

NTPC, Barh Stg-I, U-1 (660 MW) has been commissioned on 12.11.2021.

BRBCL, Nabinagar TPS U-4 (250 MW) has been commissioned on 01.12.2021.

NTPC, Barauni TPS U-9 (250 MW) has been commissioned on 01.11.2021.

ANNEXURE-IV B

New Thermal Generating Units declared Commercial Operation during the year 2021-22 in Eastern Region

Sl.	State	Project Name	Implementing Agency	Unit No.	Capacity (MW)	COD
1	Odisha	Darlipalli STPP	NTPC	U-2	800	01.09.2021
2	Bihar	New Nabi Nagar STPP	Joint Venture of NTPC and	U-2	660	23.07.2021
3	Bihar	Barh-St-I	NTPC	U-1	660	12.11.2021
4	Bihar	Barauni TPP	NTPC	U-9	250	01.11.2021
5	Bihar	Nabinagar TPP (BRBCL)	Joint Venture of NTPC and Railways	U-4	250	01.12.2021
				Total	2620	

New Hydro Generating Units declared Commercial Operation during the year 2021-22 in Eastern Region

Sl.	State	Project Name	Implementing Agency	Unit No.	Capacity (MW)	COD
1	Sikkim	Rongnichu HEP	MBPCL (Madhya Bharat Power Corporation Ltd.)	U-1	56.5	02.07.2021
2	Sikkim	Rongnichu HEP	MBPCL (Madhya Bharat Power Corporation Ltd.)	U-2	56.5	02.07.2021
				Total	113	

Thermal Generating Units retired during the year 2021-22 in Eastern Region

Sl.	State	Project Name	Agency	Unit No.	Capacity (MW)	Date of Retirement
1	Odisha	Talcher TPS	NTPC	U-1	60	01.04.2021
2	Odisha	Talcher TPS	NTPC	U-2	60	01.04.2021
3	Odisha	Talcher TPS	NTPC	U-3	60	01.04.2021
4	Odisha	Talcher TPS	NTPC	U-4	60	01.04.2021
5	Odisha	Talcher TPS	NTPC	U-5	110	01.04.2021
6	Odisha	Talcher TPS	NTPC	U-6	110	01.04.2021
7	Jharkhand	Bokaro "B"	DVC	U-3	210	01.04.2021
8	Bihar	Muzaffarpur TPS	KBUNL	U-1	110	08.09.2021
9	Bihar	Muzaffarpur TPS	KBUNL	U-2	110	08.09.2021
10	West Bengal	Bandel TPS	WBPDCL	U-1	60	21.02.2022
11	West Bengal	Kolaghat TPS	WBPDCL	U-1	210	21.02.2022
12	West Bengal	Kolaghat TPS	WBPDCL	U-2	210	21.02.2022
				Total	1370	

Annexure-V

Constituent-wise Performance ER during the year 2021-22

SYSTEM	Gross Generation(MU)				Auxiliary power Consumption(MU)				Net Generation (MU)				Import from	Exchange	Energy	Net Peak
	Hydro	Thermal	RES (Hy+Solar	Total	Hydro	Thermal	Solar	Total	Hydro	Thermal	Solar	Total	Captive (MU)	Net Import(+)	Consumption(MU)	Demand
														Net Export(-)		Met (MW)
BSPHCL	0.00	2657.86	315.04	2972.90	0.00	297.02	0.00	297.02	0.00	2360.84	315.04	2675.88	0.00	33649.86	36325.7	6490
JUVNL	302.47	1767.12	0.00	2069.59	0.10	184.76	0.00	184.86	302.37	1582.36	0.00	1884.73	503.03	8342.04	10729.8	1611
DVC	488.90	40775.46	0.00	41264.36	1.95	2938.17	0.00	2940.12	486.95	37837.29	0.00	38324.24	155.31	-14738.99	23740.6	3338
Odisha (OPGC+OHPC+TTPS)	4789.17	10024.05	700.24	15513.47	41.49	758.24	0.00	799.73	4747.68	9265.81	700.24	14713.73	9350.01	14511.87	38575.6	5643
WBPDCL+WBSEDCL+DPL	1702.52	32673.43	170.67	34546.63	0.00	2841.27	0.00	2841.27	1702.52	29832.16	170.67	31705.36	2585.04	9499.47	43789.9	7417
CESC	0.00	5726.06	0.00	5726.06	0.00	444.91	0.00	444.91	0.00	5281.16	0.00	5281.16	0.00	5029.50	10310.7	2006
HEL	0.00	4275.64	0.00	4275.64	0.00	327.50	0.00	327.50	0.00	3948.14	0.00	3948.14	0.00	-3948.14		
Sikkim	0.00	0.00	17.00	17.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	17.00	0.00	602.56	619.6	133
NTPC	0.00	70613.95	12.83	70626.78	0.00	5131.00	0.00	5131.00	0.00	65482.95	12.83	65495.78	0.00	-65495.78		
MPL	0.00	7489.22	0.00	7489.22	0.00	431.38	0.00	431.38	0.00	7057.84	0.00	7057.84	0.00	-7057.84		
APNRL	0.00	3727.46	0.00	3727.46	0.00	321.26	0.00	321.26	0.00	3406.20	0.00	3406.20	0.00	-3406.20		
GMR	0.00	4880.62	0.00	4880.62	0.00	330.28	0.00	330.28	0.00	4550.35	0.00	4550.35	0.00	-4550.35		
JITPL	0.00	8559.40	0.00	8559.40	0.00	543.21	0.00	543.21	0.00	8016.19	0.00	8016.19	0.00	-8016.19		
NHPC (Inc TLDP= 37.84 MU)	4301.34	0.00	0.00	4301.34	0.00	0.00	0.00	0.00	4301.34	0.00	0.00	4301.34	0.00	-4301.34	0.00	
Chuzachen HPS	507.80	0.00	0.00	507.80	0.00	0.00	0.00	0.00	507.80	0.00	0.00	507.80	0.00	-507.80	0.00	
Dikchu HPS	484.48	0.00	0.00	484.48	0.00	0.00	0.00	0.00	484.48	0.00	0.00	484.48	0.00	-484.48	0.00	
Jorethang HPS	442.63	0.00	0.00	442.63	0.00	0.00	0.00	0.00	442.63	0.00	0.00	442.63	0.00	-442.63	0.00	
Tashiding HPS	451.14	0.00	0.00	451.14	0.00	0.00	0.00	0.00	451.14	0.00	0.00	451.14	0.00	-451.14	0.00	
Teesta-III HPS	6257.96	0.00	0.00	6257.96	0.00	0.00	0.00	0.00	6257.96	0.00	0.00	6257.96	0.00	-6257.96	0.00	
Rongnichu HEP	301.69	0.00	0.00	301.69	0.00	0.00	0.00	0.00	301.69	0.00	0.00	301.69	0.00	-301.69	0.00	
CHPC(Birpara Receipt)	1793.10	0.00	0.00	1793.10	0.00	0.00	0.00	0.00	1793.10	0.00	0.00	1793.10	0.00	-1793.10	0.00	
KHPS	52.29	0.00	0.00	52.29	0.00	0.00	0.00	0.00	52.29	0.00	0.00	52.29	0.00	-52.29	0.00	
THPS	2771.22	0.00	0.00	2771.22	0.00	0.00	0.00	0.00	2771.22	0.00	0.00	2771.22	0.00	-2771.22	0.00	
Dagachu HPS	500.54	0.00	0.00	500.54	0.00	0.00	0.00	0.00	500.54	0.00	0.00	500.54	0.00	-500.54	0.00	
Mangdechhu HEP	2822.25	0.00	0.00	2822.25	0.00	0.00	0.00	0.00	2822.25	0.00	0.00	2822.25	0.00	-2822.25	0.00	
Total Drawal by HVDC Sahsaram,Alipurduar & Others														54.20	54.20	
Total	27969.51	193170.28	1215.79	222355.57	43.55	14548.99	0.00	14592.53	27925.96	178621.29	1215.79	207763.04	12593.39	-56210.44	164146.0	25145
										207763.04						

		BSPHCL	JUSNL	DVC	Odisha	WBSEDCL	CESC	Sikkim	Region
Annual Load Factor		63.9	76.1	81.2	78.0	67.4	58.7	53.0	74.5

Note: 1. BSPHCL exchange inclusive of the drawal of Nepal from BSPHCL network .

2. Sikkim's generarion figure is estimated

3. Net Exchange of Energy is inclusive of Transmission loss at the periphery of respectives system.

4. All the figures considered above for operational data,need not to be used for any commercial purposes

वर्ष 2021-22 के दौरान राज्यवार मासिक वास्तविक अधिकतम मांग (मे.वा. में)
CONSTITUENT WISE MONTHLY PEAK DEMAND MET DURING 2021-22

(All figures in Net MW)

MONTH	BSPHCL Peak Demand Met	JUSNL Peak Demand Met	DVC Peak Demand Met	ODISHA Peak Demand Met	WBSEDCL Peak Demand Met	CESC Peak Demand Met	SIKKIM Peak Demand Met	ER Peak Demand Met	% Growth w.r.t 2020-21
Apr-21	5795	1582	3085	5353	7417	2006	105	24405	34.89
May-21	5919	1557	2965	5643	6928	1814	98	24191	19.96
Jun-21	6084	1520	2916	4984	7003	1934	90	23494	7.61
Jul-21	6490	1590	2909	5561	7243	1805	96	25145	11.05
Aug-21	6241	1611	2914	5552	7168	1893	98	24157	8.85
Sep-21	6340	1543	3037	5605	7234	1783	102	25010	6.15
Oct-21	5774	1520	2976	5458	7066	1818	104	23675	1.29
Nov-21	4345	1513	2998	5342	5243	1530	118	20961	2.72
Dec-21	4781	1552	2932	5427	5025	1321	133	20631	5.55
Jan-22	5243	1610	3124	5110	5471	1247	133	21204	3.45
Feb-22	5059	1505	3102	5434	5286	1292	132	21198	2.69
Mar-22	5651	1605	3338	5370	7326	1766	122	24582	2.36
MAXIMUM	**6490**	**1611**	**3338**	**5643**	**7417**	**2006**	**133**	**25145**	**4.70**
MINIMUM	**4345**	**1505**	**2909**	**4984**	**5025**	**1247**	**90**	**20631**	**14.03**
AVERAGE	**5644**	**1559**	**3025**	**5403**	**6534**	**1684**	**111**	**23221**	**8.44**
% Avg.Peak Growth wrt 2020-21	**5.42**	**7.81**	**8.08**	**21.47**	**3.25**	**4.72**	**11.19**	**8.44**	

वर्ष 2020-21 के दौरान राज्यवार मासिक वास्तविक अधिकतम मांग (मे.वा. में)
CONSTITUENT WISE MONTHLY PEAK DEMAND MET DURING 2020-21

(All figures in Net MW)

MONTH	BSPHCL Peak Demand Met	JUSNL Peak Demand Met	DVC Peak Demand Met	ODISHA Peak Demand Met	WBSEDCL Peak Demand Met	CESC Peak Demand Met	SIKKIM Peak Demand Met	ER Peak Demand Met	% Growth w.r.t 2019-20
Apr-20	4725	1291	1417	3636	5937	1325	94	18093	-19.15
May-20	5330	1396	2462	4024	6014	1539	88	20166	-11.48
Jun-20	5718	1368	2715	4293	6626	1728	84	21832	-4.28
Jul-20	5774	1426	2918	4474	6754	1804	86	22643	-2.21
Aug-20	5915	1470	2801	4476	6950	1744	77	22192	-5.15
Sep-20	5936	1522	2933	4575	7015	1744	91	23561	1.88
Oct-20	5783	1513	3173	4973	7044	1806	96	23374	7.68
Nov-20	4590	1422	2884	4609	5788	1628	110	20406	6.21
Dec-20	4856	1500	2925	4224	5140	1481	115	19546	5.04
Jan-21	5153	1501	3141	4306	5600	1269	119	20496	9.52
Feb-21	5009	1416	3084	4803	5781	1377	117	20643	8.87
Mar-21	5452	1527	3129	4984	7291	1853	120	24016	28.65
MAXIMUM	**5936**	**1527**	**3173**	**4984**	**7291**	**1853**	**120**	**24016**	**2.64**
MINIMUM	**4590**	**1291**	**1417**	**3636**	**5140**	**1269**	**77**	**18093**	**-2.77**
AVERAGE	**5353**	**1446**	**2799**	**4448**	**6328**	**1608**	**100**	**21414**	**1.36**
% Avg.Peak Growth wrt 2019-20	**7.27**	**8.90**	**-2.55**	**-1.21**	**1.04**	**-10.83**	**0.25**	**1.36**	**82.99**

वर्ष 2019-20 के दौरान राज्यवार मासिक वास्तविक अधिकतम मांग (मे.वा. में)
CONSTITUENT WISE MONTHLY PEAK DEMAND MET DURING 2019-20

(All figures in Net MW)

MONTH	BSPHCL Peak Demand Met	JUSNL Peak Demand Met	DVC Peak Demand Met	ODISHA Peak Demand Met	WBSEDCL Peak Demand Met	CESC Peak Demand Met	SIKKIM Peak Demand Met	ER Peak Demand Met
Apr-19	5155	1325	3014	5140	6913	2124	98	22378
May-19	5326	1389	2963	4606	7104	2312	93	22781
Jun-19	5483	1362	2950	4949	7169	2329	89	22808
Jul-19	5433	1323	2871	4861	7269	2131	85	23154
Aug-19	5748	1316	2848	4856	7091	1940	90	23398
Sep-19	5789	1328	2868	5292	7117	1876	93	23126
Oct-19	5020	1277	2831	4656	6597	1810	96	21706
Nov-19	4323	1280	2807	4026	5257	1621	102	19212
Dec-19	4614	1356	2848	4198	4754	1359	111	18608
Jan-20	4571	1373	2979	3605	5064	1266	115	18714
Feb-20	4280	1331	2973	4017	5177	1345	114	18962
Mar-20	4146	1274	2509	3824	5650	1528	108	18668
MAXIMUM	**5789**	**1389**	**3014**	**5292**	**7269**	**2329**	**115**	**23398**
MINIMUM	**4146**	**1274**	**2509**	**3605**	**4754**	**1266**	**85**	**18608**
AVERAGE	**4991**	**1328**	**2872**	**4503**	**6264**	**1803**	**100**	**21126**
% Avg.Peak Growth wrt 2018-19	**7.87**	**5.50**	**-0.65**	**-3.14**	**-3.51**	**1.95**	**6.04**	**0.74**

संलग्नक / **ANNEXURE - VIB**

वर्ष 2021-22 के दौरान राज्यवार मासिक वास्तविक अधिकतम मांग (मे.वा. में)
Statewise Monthly Actual Peak Demand in MW during 2021-22

(Ex-Bus Figs)

महिना / Month	States / Actual / UR	BIHAR	JHARKHAND	DVC	ODISHA	WBSEDCL	CESC	SIKKIM	EASTERN REGION
		1	2	3	4	5	6	7	8
अप्रैल / Apr-21	Actual	5795	1582	3085	5353	7417	2006	105	24405
	Unrestricted	6011	1719	3086	5355	7419	2013	105	24405
मई / May-21	Actual	5919	1557	2965	5643	6928	1814	98	24191
	Unrestricted	5927	1566	2965	5643	6928	1817	98	24191
जून / June-21	Actual	6084	1520	2916	4984	7003	1934	90	23494
	Unrestricted	6102	1702	2923	4984	7012	1935	90	23521
जुलाई / July-21	Actual	6490	1590	2909	5561	7243	1805	96	25145
	Unrestricted	7154	1709	2909	5561	7259	1805	96	26019
अगस्त / Aug-21	Actual	6241	1611	2914	5552	7168	1893	98	24157
	Unrestricted	6679	1786	2919	5575	7182	1893	99	24236
सितंबर / Sep-21	Actual	6340	1543	3037	5605	7234	1783	102	25010
	Unrestricted	6613	1706	3037	5610	7239	1783	102	25454
अक्तूबर / Oct-21	Actual	5774	1520	2976	5458	7066	1818	104	23675
	Unrestricted	6544	1698	2976	5458	7101	1825	104	23979
नवम्बर / Nov-21	Actual	4345	1513	2998	5342	5243	1530	118	20961
	Unrestricted	4626	1719	2998	5344	5249	1530	118	20998
दिसम्बर / Dec-21	Actual	4781	1552	2932	5427	5025	1321	133	20631
	Unrestricted	4967	1808	2932	5430	5030	1324	133	20992
जनवरी / Jan-22	Actual	5243	1610	3124	5110	5471	1247	133	21204
	Unrestricted	5773	1850	3125	**5115**	5471	1247	133	21396
फरवरी / Feb-22	Actual	5059	1505	3102	5434	5286	1292	132	21198
	Unrestricted	5080	1764	3102	5434	5288	1295	132	21540
मार्च / March-22	Actual	5651	1605	3338	5370	7326	1766	122	24582
	Unrestricted	6002	1887	3355	5389	7342	1768	122	24762

संलग्नक / ANNEXURE - VII A

वर्ष 2021-22 में विद्युत की राज्यवार मासिक उपभोग (मि.यू. में)

Constituent wise net monthly energy consumption during 2021-22										(All Figures in Net MU)	
MONTH	BSPHCL	JUSNL	DVC (Own)	Odisha	WBSEDCL (Own)	CESC	West Bengal (Total)	Sikkim	Eastern Region (Total)	Avg. Consumption (in MU) per Day	% Growth w.r.t 2020-21
Apr-21	3301	922	2027	3141	4396	1034	5430	46	14867	**496**	**54.4**
May-21	2980	827	1865	3072	3632	893	4525	47	13316	**430**	**20.8**
Jun-21	3243	863	1930	3028	3865	884	4749	45	13858	**462**	**9.3**
Jul-21	3817	950	1931	3432	4271	1001	5272	48	15450	**498**	**11.3**
Aug-21	3703	953	2000	3481	4324	1028	5352	47	15536	**501**	**11.9**
Sep-21	3540	900	1941	3214	3965	960	4925	47	14567	**486**	**4.2**
Oct-21	3014	887	1991	3315	3835	955	4790	48	14045	**453**	**0.8**
Nov-21	2235	848	1908	3087	2810	724	3534	52	11664	**389**	**8.4**
Dec-21	2390	886	1982	3056	2866	678	3544	62	11920	**385**	**6.4**
Jan-22	2678	940	2058	3314	2982	654	3636	64	12690	**409**	**6.1**
Feb-22	2316	801	1880	2980	2824	609	3433	60	11470	**410**	**3.5**
Mar-22	3108	952	2227	3455	4020	890	4910	54	14706	**474**	**4.8**
TOTAL	**36325**	**10729**	**23740**	**38575**	**43790**	**10310**	**54100**	**620**	**164089**	**450**	**10.9**
AVERAGE	3027	894	1978	3215	3649	859	4508	52	13674	449	11.8
MAXIMUM	3817	953	2227	3481	4396	1034	5430	64	15536	501	54.4
MINIMUM	2235	801	1865	2980	2810	609	3433	45	11470	385	0.8
% Growth wrt 2020-21	**4.95**	**9.32**	**11.10**	**28.97**	**4.72**	**5.29**	**4.83**	**11.31**	**10.85**	**10.86**	
Per day Consumption	**100**	**29**	**65**	**106**	**120**	**28**	**148**	**2**	**450**		

वर्ष 2020-21 में विद्युत की राज्यवार मासिक उपभोग (मि.यू. में)

Constituent wise net monthly energy consumption during 2020-21										(All Figures in Net MU)	
MONTH	BSPHCL	JUSNL	DVC (Own)	ODISHA	WBSEDCL (Own)	CESC	WEST BENGAL (Total)	SIKKIM	Eastern Region (Total)	Avg. Consumption (MU) Per day	% Growth w.r.t 2019-20
Apr-20	2358	683	857	2081	2931	663	3594	43	9626	**321**	**-25.2**
May-20	2793	746	1424	2376	2917	720	3637	42	11024	**356**	**-20.9**
Jun-20	3042	776	1753	2484	3659	909	4568	42	12675	**423**	**-8.4**
Jul-20	3331	837	1892	2722	4067	979	5046	41	13878	**448**	**-0.8**
Aug-20	***3440***	***853***	***1894***	***2632***	***4083***	***934***	5017	***36***	13887	**448**	**-2.9**
Sep-20	3355	877	1876	2756	4064	989	5053	41	13977	**466**	**4.4**
Oct-20	3334	905	1942	2755	3950	983	4933	43	13928	**449**	**14.6**
Nov-20	2251	788	1854	2257	2814	734	3548	47	10757	**359**	**3.9**
Dec-20	2509	852	1948	2252	2905	658	3563	58	11199	**361**	**6.6**
Jan-21	2791	857	2039	2342	3188	656	3844	59	11956	**386**	**10.2**
Feb-21	2459	760	1831	2290	3050	629	3679	52	11083	**396**	**10.2**
Mar-21	2948	880	2059	2963	4187	938	5125	***53***	14032	**453**	**33.8**
TOTAL	**34610**	**9812**	**21368**	**29911**	**41815**	**9792**	**51607**	**556**	148022	**406**	**0.9**
AVERAGE	2884	818	1781	2493	3485	816	4301	46	12335	405	
MAXIMUM	3440	905	2059	2963	4187	989	5125	59	14032	466	
MINIMUM	2251	683	857	2081	2814	629	3548	36	9626	321	
% Growth wrt 2019-20	***7.94***	***9.27***	***-4.48***	***0.63***	***-1.07***	***-11.13***	***-3.15***	***-1.44***	***0.63***		
Per day Consumption	**95**	**27**	**58**	**82**	**114**	**27**	**141**	**2**	**404**		

वर्ष 2019-20 में विद्युत की राज्यवार मासिक उपभोग (मि.यू. में)

Constituent wise net monthly energy consumption during 2019-20									(All Figures in Net MU)	
MONTH	BSPHCL	JUSNL	DVC (Own)	ODISHA	WBSEDCL (Own)	CESC	WEST BENGAL (Total)	SIKKIM	Eastern Region (Total)	Avg. Consumption (MU) Per day
Apr-19	2621	715	1942	2719	3801	1017	4817	43	12862	**429**
May-19	3132	818	2015	2539	4177	1206	5382	44	13943	**450**
Jun-19	3104	768	1924	2668	4174	1143	5317	43	13843	**461**
Jul-19	2918	750	1954	2852	4310	1161	5471	41	13992	**451**
Aug-19	***3383***	***758***	***1875***	***2924***	***4257***	***1060***	5317	***44***	***14307***	**462**
Sep-19	2988	743	1797	2836	3958	1022	4980	43	13384	**446**
Oct-19	2663	730	1855	2495	3436	924	4359	43	12149	**392**
Nov-19	2189	724	1793	2111	2723	754	3477	48	10348	**345**
Dec-19	2195	767	1872	2205	2718	684	3403	57	10506	339
Jan-20	2494	788	1933	2072	2822	673	3496	58	10846	350
Feb-20	2185	715	1829	2086	2886	649	3535	53	10419	**359**
Mar-20	***2194***	***707***	***1583***	***2217***	***3007***	***724***	***3731***	***50***	***10490***	***338***
TOTAL	**32066**	**8982**	**22372**	**29724**	**42268**	**11018**	**53286**	**565**	**147090**	**402**
AVERAGE	2672	748	1864	2477	3522	918	4441	47	12258	402
MAXIMUM	3383	818	2015	2924	4310	1206	5471	58	14307	462
MINIMUM	2185	707	1583	2072	2718	649	3403	41	10348	338
% Growth wrt 18-19	***5.95***	***4.44***	***-0.21***	***-7.03***	***2.74***	***2.74***	***2.74***	***4.32***	***0.91***	
Per day Consumption	**88**	**25**	**61**	**81**	**115**	**30**	**146**	**2**	**402**	

संलग्नक / ANNEXURE-VII.B

वर्ष 2021-22 में विद्युत की राज्यवार मासिक आवश्यकता एवं उपभोग (मि.यू. में)

Statewise Monthly Energy Requirement and Consumption in MU during 2021-22

(EX-Bus Figs)

राज्य / States →	BIHAR		JHARKHAND		DVC		ODISHA		WBSEDCL		CESC		SIKKIM		Eastern Region	
मास / Month ↓	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement
	1	2	3	4	5	6	7	8	9	10	11	12	13		14	
अप्रैल / Apr-21	3301	3321	922	958	2027	2028	3141	3142	4396	4406	1034	1035	46	46	14877	14936
मई / May-21	2980	3004	827	832	1865	1862	3072	3072	3632	3647	893	893	47	47	13325	13357
जून / June-21	3243	3246	863	879	1930	1931	3028	3029	3865	3870	884	884	45	45	13862	13885
जुलाई / July-21	3817	3838	950	974	1931	1932	3432	3433	4271	4275	1001	1001	48	48	15452	15500
अगस्त / Aug-21	3703	3768	953	997	2000	2001	3481	3483	4325	4334	1028	1029	47	47	15542	15659
सितंबर / Sep-21	3540	3624	900	930	1941	1941	3214	3211	3965	3970	960	960	47	47	14568	14682
अक्तूबर / Oct-21	3014	3098	887	966	1991	1993	3315	3318	3835	3840	955	956	48	48	14048	14219
नवम्बर / Nov-21	2235	2251	848	875	1908	1908	3087	3089	2810	2811	724	724	52	52	11664	11710
दिसम्बर / Dec-21	2390	2425	886	964	1982	1982	3056	3057	2866	2868	678	678	62	62	11925	12037
जनवरी / Jan-22	2678	2704	940	1003	2058	2059	3314	3314	2982	2984	654	654	64	64	12691	12782
फरवरी / Feb-22	2316	2343	801	853	1880	1881	2980	2981	2824	2826	609	609	60	60	11473	11553
मार्च / March-22	3105	3160	952	1056	2227	2230	3455	3459	4020	4025	890	891	54	54	14705	14876
Total	**36322**	**36782**	**10729**	**11289**	**23740**	**23747**	**38575**	**38589**	**43791**	**43858**	**10310**	**10315**	**619**	**620**	**164132**	**165200**

Note : Drawl from Central Sector is at ISGS periphery.

Inter-Regional and Intra-Regional Exchange of Energy (in MWH) During the Year 2021-22

	Constituents	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-21	Feb-21	Mar-21	Total
Injection	APNRL	350017.0119	264002.758	251307.9218	287357.376	215531.2684	174531.9982	283788.1427	279561.6699	326779.5604	323553.524	305938.6151	343805.9602450	3406175.8067500
	BARH-II	784095.9559	516259.3356	649898.6543	632054.8949	743994.1297	555196.7129	365655.0119	60360.93035	475648.0188	716261.8815	677539.9561	813329.6738230	6990295.1557840
	BARH SG1_INFIRM	0	0	0	4830.838312	82895.74856	94495.06239	84343.11086	0	0	0	0	0.0000000	266564.7601300
	BRBCL	469952.5742	394985.9567	394789.4477	308231.7031	354099.1066	259794.9946	374200.0771	429631.7031	563707.7034	561877.958	484744.577	608429.2302610	5204445.0318550
	CHUKHA	34763.51179	131951.6506	259974.0845	222879.0321	254744.0171	229114.2177	258932.3457	134212.7716	78236.50494	0	0	19035.8599630	1623843.9959630
	CHUZACHEN	17062.2432	39925.5552	73600.4256	88096.5864	87480.6912	73926.2784	54742.9344	27337.2	15331.6416	10838.5056	6605.088	12846.2592000	507793.4088000
	DARLIPALI	422887.7502	413947.0678	477961.7924	545449.2852	549630.6681	977594.0628	917559.366	963999.8736	407238.4928	866513.2578	700863.5191	1113068.6861180	8356713.8218750
	DARLIPALI_U2_INFIRM	14119.95893	0	35813.59947	144867.6609	38573.3828	0	0	0	0	0	0	0.0000000	233374.6020530
	DIKCHU	23251.9997	56932.72655	73566.18105	76769.92652	77859.45373	66750.81751	46482.18137	21697.72707	9700.181713	8773.545389	8042.636392	14657.9090020	484485.2859890
	DVC	1435038.276	1374217.898	1248078.216	1300735.23	967618.6506	1177294.531	770845.9035	1010167.986	1265319.51	1348469.85	1196047.056	1645136.6436410	14738969.7507710
	NER	0	65098.48385	0	0	0	0	0	0	0	42193.68628	333049.1229	37888.7817180	478230.0747820
	WR	1283331.044	768978.7356	951566.0592	1110335.916	539615.4168	0	144910.8952	0	0	0	0	0.0000000	4798738.0669760
	FSTPP - I & II	610293.7162	689015.3157	717898.9642	640548.6525	514002.4045	483377.293	621082.5761	770182.3576	844793.8729	833720.4592	864125.1383	906908.1978290	8495948.9480190
	FSTPP-III	303036.7378	248187.7176	251106.3585	231807.4733	222140.4182	247650.4452	142392.5072	254951.6322	277540.7704	278643.4205	156062.4515	295618.2886330	2909138.2211180
	GMRKEL	406277.3021	376972.6479	344962.4664	354918.3934	366309.7397	427334.2503	414519.6323	410742.7596	346787.1965	381667.7053	314733.815	405109.0869020	4550334.9954780
	JITPL	692799.6993	662144.645	690702.463	684186.2448	733720.4996	677314.9022	383350.6869	608226.6848	747725.6653	662647.9207	682864.066	790538.8283100	8016222.3057530
	JORETHANG HEP	11408.352	23129.76	51998.912	72112.224	70639.04	67028.848	56740.256	32450.592	18798.336	13466.336	10498.752	14356.5760000	442627.9840000
	KHSTPP-I	523157.4809	481142.6984	370636.5866	332318.9698	454914.0319	458940.0611	466737.7154	392500.5118	384870.5849	464532.668	456364.1386	500771.5171770	5286886.9646000
	KHSTPP-II	995923.7477	935011.5581	886978.3628	885881.1406	708667.9684	575251.1941	645484.8086	860107.7849	858059.2777	871880.3853	703945.8749	677676.0999440	9604868.2029750
	KURICHU	0	20666.4264	46898.2548	52235.1036	48290.4756	48585.8772	36933.4512	14356.9764	3208.4136	0	0	5358.9924000	276533.9712000
	MANGDECHU	91053.52494	245491.341	400257.011	464422.3182	510338.1372	502413.1586	310983.9242	138569.5259	61350.90846	22804.47249	18819.49073	78486.8718910	2844990.6845840
	MPL	678096.898	632631.2605	600339.2247	642115.1887	670668.4255	626167.7392	600194.9395	567878.6489	586951.2305	586843.9214	484863.8315	381040.6324390	7057791.9406730
	MTPS-II	225834.572	180255.996	194065.812	174433.244	137270.832	112403.16	189198.548	204635.844	224521.324	214752.456	221448.376	261356.7400000	2340176.9040000
	NPGC	399821.6394	372333.3967	401028.7252	424985.5765	686223.6172	659483.1843	710252.1816	631492.054	820288.296	674420.5236	801602.47	917103.9020430	7499035.5665710
	NPGC-INFIRM	0	0	1573.774208	174146.1571	0	0	0	0	0	22619.97853	34871.48529	57751.8700490	290963.2651430
	RANGIT	14794.5336	25137.27	36004.0992	41477.2056	40661.9544	41611.5804	42515.6796	28029.5388	20357.898	15129.6672	9343.1976	16000.8408000	331063.4652000
	RONGNICHU HEP INFIRM	54.752	0	6970.72	1127.241	0	0	0	0	0	0	0	0	8152.7130000
	TALCHER SOLAR	1254.69435	1270.44255	993.7455	941.8587	1023.618	887.2251	1064.8521	976.5588	963.97095	1024.24905	1199.72745	1246.7854500	12847.7280000
	TALA	16855.75376	174763.5717	414167.8754	457501.4265	522483.2713	479888.4674	366765.0317	177266.7839	34751.98188	0	0	12304.0477880	2656748.2114100
	TUL	270017.2315	565249.6645	904350.5627	937512.2422	939824.134	874749.3003	611765.5212	340730.1784	231946.1068	175522.3255	138975.9981	267314.7607150	6257958.0258170
	TEESTA	150811.524	282020.6491	257856.795	360952.03	387501.5577	371357.9237	302647.3061	184824.7256	92540.9082	59187.34487	55360.98125	142417.9258860	2647479.6712520
	THEP	11711.488	20548.59186	45322.544	74857.472	74622.24	69331.936	60391.344	34206.528	21208.96	15437.632	11513.76	11995.6000000	451148.0958610
	TPTCL	10425.79507	19755.57461	51653.88782	85103.78369	78933.04003	73784.4991	58675.88496	40303.31105	25732.66634	19405.25479	17362.99673	19398.6574320	500535.3516240
	TSTPP	442391.5492	589598.0354	598853.1705	584713.9042	658106.4054	593589.2761	638178.7417	602450.1387	276097.6597	428780.3902	614902.4921	670620.3885120	6698282.1515540
	VAE_ER	0	0	0	0	0	0	0	0	0	0	0	0.0000000	0.0000000
	WBSETCL	0	0	0	0	0	0	0	0	287517.1289	18775.23971	104057.9105	0.0000000	410350.2790900
	RONGNICHU HEP	0	0	0	63717.143	73997.76	63898.528	49825.632	23842.336	12558.88	5637.152	53.856	0.0000000	293531.2870000
	BRBCL_U4_INFIRM	0	0	0	0	0	0	4312.500963	37396.29228	0	0	0	0	41708.7932460
	BARH-I	0	0	0	0	0	0	0	227036.4919	307373.9007	338062.0772	105829.7451	286223.3508020	1264525.5656340
	BARH SG1_U2_INFIRM	0	0	0	0	0	0	0	0	0	0	0	0.0000000	0.0000000
	Bhutan_State	0	0	0	0	0	0	0	0	21934.22271	0	0	0.0000000	21934.2227080
	PTC_BHUTAN	0	0	0	0	0	0	0	0	0	0	0	115185.7720420	115185.7720420
	Total	10690541.32	10571626.73	11691176.7	12463623.44	11812382.1	11063747.52	10015473.69	9510128.117	9649841.774	9983443.788	9521631.125	11442984.74	128416601

Annexure-VIII-A (Page-2/2)

Inter-Regional and Intra-Regional Exchange of Energy (in MWH) During the Year 2021-22

	Constituents	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-21	Feb-21	Mar-21	Total
	BSPHCL	-2994510.121	-2795053.761	-2980199.306	-3571675.28	-3449766.981	-3311217.317	-2796700.333	-1946554.279	-2040902.952	-2347040.054	-1995499.875	-2856127.3967660	-33085247.6555650
	JUVNL	-705470.636	-662720.961	-700787.9216	-754585.4724	-734148.798	-684435.0674	-678719.9896	-675022.7756	-658028.9973	-696097.0756	-542668.1863	-709189.1330950	-8201875.0138770
	GRIDCO	-1284054.614	-992274.2507	-1093150.115	-1220804.337	-982199.4474	-1053472.419	-1160336.447	-1295367.643	-1238684.307	-1285311.792	-1269499.872	-1392840.8173750	-14267996.0615560
	SIKKIM	-44547.17098	-44892.51353	-42316.54781	-44991.20888	-44169.13695	-44412.80875	-45095.06369	-49732.51552	-60018.97762	-62326.42619	-58057.12062	-51883.9149960	-592443.4055170
	WBSETCL	-1262129.63	-967130.9263	-1133356.141	-1565183.164	-1699141.007	-1379083.887	-789238.1019	-8935.488524	0	0	0	-708325.6585470	-9512524.0048850
	NR	-1205200.778	-2235232.947	-3021903.579	-3183939.406	-2731343.256	-2299038.643	-1977903.097	-2457213.197	-2934811.67	-2526513.66	-2358381.867	-2134929.3539190	-29066411.4531220
	NER	-34277.87322	0	-309369.3175	-371342.9475	-155332.2191	-316591.5288	-338862.7621	-207683.7776	-275756.8969	0	0	0.0000000	-2009217.3227290
	SR	-2164203.175	-1888477.637	-1461037.373	-878030.0409	-1333665.342	-1150733.337	-1570717.103	-1641325.821	-1505808.008	-1760681.001	-1792926.305	-2308312.6415250	-19455917.7843450
	WR	0	0	0	0	0	-150320.2578	0	-627179.0825	-261736.9061	-373026.3921	-596435.6273	-283578.9149390	-2292277.1807780
	NVVN-BD	-573065.445	-628244.0629	-638806.9717	-581578.3896	-506196.0639	-519078.7585	-533519.7764	-476956.2133	-396728.2143	-478273.0136	-474793.8861	-563726.4671230	-6370967.2624390
Drawal	NVVN-NEPAL	-239185.5221	-158264.8684	-120151.8505	-82425.37831	0	0	0	0	-65795.34489	-162219.3438	-177660.7255	-141905.6713200	-1147608.7048170
	HVDC ALIPURDUAR	-392.763	-522.9	-704.058	-790.0632	-785.8284	-792.3876	-729.0948	-463.437	-387.2676	-347.8782	-322.3332	-366.3576000	-6604.3686000
	HVDC SASARAM	-608.316284	-643.613828	-624.014267	-661.235317	-651.391776	-622.54229	-618.741163	-572.957632	-358.067339	-192.370325	-171.455798	-219.0486900	-5943.7547090
	CHUKHA	0	0	0	0	0	0	0	0	0	-71718.14188	-59419.27786	0.0000000	-131137.4197420
	KURICHU	-2947.7592	0	0	0	0	0	0	0	0	-4676.3964	-8325.2844	0.0000000	-15949.4400000
	Tala	0	0	0	0	0	0	0	0	0	-40044.41089	-41599.55562	0.0000000	-81643.9665040
	BARH SG1_INFIRM	-2719.551278	-4634.1648	-1832.302835	0	0	0	0	-744.861477	0	0	0	0.0000000	-9930.8803900
	DARLIPALI_U2_INFIRM	0	-4418.921456	0	0	0	0	0	0	0	0	0	0.0000000	-4418.9214560
	RONGNICHU HEP INFIRM	0	-53.952	0	0	0	0	0	0	0	0	0	0	-53.9520000
	BRBCL_U4_INFIRM	0	0	0	0	-26.094	-1107.797148	0	0	0	0	0	0	-1133.8911480
	BARH SG1_U2_INFIRM	0	0	0	0	0	0	0	0	0	0	-3099.4848	-2203.8768000	-5303.3616000
	Bhutan_State	0	0	0	0	0	0	0	0	0	-3535.600025	0	0.0000000	-3535.6000250
	PTC_BHUTAN	0	0	0	0	0	0	0	0	0	-93634.47668	-90524.62715	0.0000000	-184159.1038330
	Total	-10513313.36	-10382565.48	-11504239.5	-12256006.92	-11637425.57	-10910906.75	-9892440.51	-9387752.049	-9439017.609	-9905638.033	-9469385.484	-11153609.25	-126452300.5
	Transmission Loss	177227.9619	189061.2521	186937.1991	207616.52	174956.5388	152840.7738	123033.1802	122376.0683	210824.1645	77805.75537	52245.64124	289375.4843	1964300.54
	% Transmission Loss	1.69	1.82	1.62	1.69	1.50	1.40	1.24	1.30	2.23	0.79	0.55	2.59	1.55

ANNEXURE-VIII (B)

IMPORT BY ODISHA FROM CAPTIVE STATIONS AND IPPs DURING 2021-22 **(ALL Figs in MU)**

SN.	Name of IPP / CGPs	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Total
1	Aarti Steel Ltd, ghantikhal	9.288	3.096	3.941	6.703	8.430	0.950	0.963	6.098	7.555	3.284	4.813	21.629	76.750
2	ACC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	Action Ispat	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	Aryan Ispat,	2.408	2.842	0.000	0.950	1.883	1.065	1.423	1.998	3.401	2.045	2.753	7.572	28.340
5	BPPL	81.317	78.474	76.259	77.595	75.764	39.280	40.815	33.865	78.772	61.901	70.516	65.330	779.888
6	BPSL, Jharsuguda	8.868	5.547	4.733	6.582	5.594	8.453	6.099	3.717	9.352	11.981	10.911	13.753	95.591
7	TSBSL, Meramundali	36.866	25.577	17.989	21.798	21.989	28.769	21.807	19.450	17.736	32.441	15.644	14.404	274.471
8	GMR Kamalanga Energy Ltd.(IPP)	233.278	204.680	197.700	200.390	222.308	193.097	243.464	231.552	173.220	129.810	213.890	239.350	2482.739
9	HINDALCO, Hirakud	1.542	1.601	1.486	1.568	1.437	0.7768	1.476	0.839	1.498	1.707	1.431	0.844	16.203
10	IFFCO, Paradeep	0.000	0.0001	0.0000	0.0001	0.0004	0.001	0.0001	0.0004	0.0002	0.0000	0.0000	0.0001	0.002
11	IMFA , Choudwar	25.647	25.063	25.811	30.969	23.104	21.972	0.000	26.423	26.490	27.457	25.512	30.380	288.827
12	JINDAL, New Duburi	5.027	4.292	3.615	4.318	0.004	2.867	6.666	6.704	8.647	3.807	3.064	5.658	54.670
13	JSPL, Angul	50.797	34.198	22.828	20.611	42.271	23.297	41.812	14.232	40.437	24.253	30.711	85.429	430.875
14	Mahavir Ferro Alloys	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.530	0.000	0.530
15	Maithan Ispat Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.274	0.530	1.133	1.989
16	Meenakshi Power Ltd. (SH)	6.233	5.196	10.305	20.347	29.907	28.805	28.805	12.122	5.342	5.502	6.044	5.616	164.226
17	MSP, Jharsuguda	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	NALCO , Angul	18.912	23.04	11.60	0.00	0.01	0.000	0.00	0.00	0.00	0.00	0.00	0.00	53.560
19	Narbheram	0.005	0.013	0.058	0.016	0.001	0.025	0.162	0.167	0.108	0.118	0.075	0.041	0.791
20	NBVL , Kharag Prasad	31.442	22.666	25.234	27.907	38.843	47.896	57.475	29.470	50.553	49.166	52.803	72.087	505.542
21	NINL , Duburi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
22	OCL	0.760	3.652	3.449	2.890	13.261	5.389	0.000	0.099	0.310	3.082	2.586	2.607	38.085
23	OPCL, Samal (SH)	5.405	7.649	8.434	10.189	9.871	7.057	7.057	9.699	8.365	5.389	5.516	8.708	93.342
24	BPPLT	0.175	3.417	13.520	16.138	19.599	16.138	19.258	8.178	4.711	4.650	2.804	1.349	109.938
25	PSAL, Keonjhar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	RSP , Rourkela	0.003	0.000	0.002	0.000	0.000	0.000	0.004	0.003	0.002	0.700	0.000	7.804	8.517
27	Shree Ganesh	0.151	0.974	0.358	0.464	0.379	0.457	1.369	0.398	0.731	0.269	0.161	2.344	8.056
28	Shyam Metallics	0.564	1.008	1.247	0.904	0.212	0.480	0.626	0.629	0.360	0.665	0.561	0.522	7.778
29	SMC Power	0.003	0.004	0.127	0.475	0.000	0.000	1.170	1.017	1.188	3.501	13.309	0.000	20.793
30	TSIL, Joda	13.841	13.803	13.271	13.186	8.782	10.073	13.018	11.971	6.100	14.072	11.788	14.421	144.325
31	Vedanta Ltd. (IPP-Unit-2)	93.928	215.864	236.118	271.700	289.362	199.436	241.219	203.850	292.625	465.599	10.800	0.000	2520.501
32	Vedanta, Jharsuguda	130.003	135.144	172.894	162.189	144.636	105.899	41.796	7.423	21.824	45.266	20.758	62.946	1050.778
33	Vedanta, Lanjigarh	0.592	0.758	0.672	0.672	0.641	0.442	0.527	0.363	0.449	0.397	0.199	0.178	5.889
34	VISA Steel, New-Duburi	3.490	1.085	0.297	0.159	0.352	0.014	0.443	0.100	0.311	0.102	0.027	0.058	6.439
35	Yazdani Steel & Power Ltd., J.J Rd	0.363	0.361	0.487	0.555	75.764	0.014	0.136	0.366	0.393	0.216	0.143	0.144	78.941
36	Vedanta Ltd. (3*600)	0.073	0.174	1.380	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.632
	Total support from CPPs & IPPs	**760.98**	**820.18**	**853.81**	**899.28**	**1034.41**	**742.65**	**777.59**	**630.73**	**760.53**	**897.65**	**507.88**	**664.31**	**9350.01**

ANNEXURE-VIII (C)

IMPORT BY JHARKHAND FROM CAPTIVE STATIONS AND IPPs DURING 2021-22											ALL Figs in MU		
Name of IPP / CGPs	**Apr-21**	**May-21**	**Jun-21**	**Jul-21**	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**	**Jan-22**	**Feb-22**	**Mar-22**	**TOTAL**
INLAND POWER LIMITED(1x63 MW)	37.163	35.935	29.959	31.221	35.741	35.902	29.690	34.850	38.620	34.968	30.555	10.860	385.464
RUNGTA (Mines)	1.271	14.149	0.632	0.109	0.121	0.066	0.225	0.169	0.008	0.006	0.259	0.263	17.278
AAPL-R	2.153	1.991	2.011	1.579	2.799	3.608	2.458	1.503	2.102	1.544	1.379	1.255	24.382
UML-R	1.909	2.047	1.775	1.401	0.027	0.585	1.205	1.326	1.528	1.608	2.601	0.363	16.375
UML-J (Tata Sponge Limited)	5.642	3.469	1.535	0.823	1.559	3.657	3.561	2.260	4.352	4.559	1.729	1.333	34.479
ABCIL	7.114	5.044	3.764	1.856	0.884	0.859	0.929	0.868	0.858	0.874	0.441	0.217	23.708
TOTAL	**55.25**	**62.64**	**39.68**	**36.99**	**41.13**	**44.68**	**38.07**	**40.98**	**47.47**	**43.56**	**36.96**	**14.29**	**538.10**

IMPORT BY DVC FROM TISCO DURING 2021-22											ALL Figs in MU		
Name of IPP / CGPs	**Apr-21**	**May-21**	**Jun-21**	**Jul-21**	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**	**Jan-22**	**Feb-22**	**Mar-22**	**TOTAL**
TISCO injection wheeling at Jamshedpur point	14.22	15.75	11.18	12.77	14.25	9.47	15.56	7.26	8.31	16.45	14.88	11.42	151.51

IMPORT BY WEST BENGAL SETCL FROM CPP & IPPs DURING 2021-22											ALL Figs in MU		
Name of IPP / CGPs	**Apr-21**	**May-21**	**Jun-21**	**Jul-21**	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**	**Jan-22**	**Feb-22**	**Mar-22**	**TOTAL**
PCBL	10.80	11.53	1.88	0.83	12.61	12.68	13.05	12.18	10.90	11.81	10.43	12.14	120.839
RENUKA	0.00	0.00	0.00	0.00	0.00	2.20	3.24	0.00	0.00	0.00	0.00	0.00	5.431
TATA POWER HALDIA	70.11	65.28	59.90	56.39	55.65	56.86	65.87	74.09	77.39	77.39	60.41	72.77	792.086
ELEC. STEEL (H)	1.68	1.53	1.36	1.50	1.23	1.33	1.34	0.90	0.88	1.69	1.55	1.63	16.624
CONCAST BENGAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
HIMADRI CHEMICAL LTD	3.09	3.14	3.03	6.16	4.02	4.42	5.18	6.21	3.81	3.62	3.99	5.32	51.992
BENGAL ENERGY LIMITED	23.36	24.09	23.31	18.19	26.07	24.83	25.62	24.82	25.85	25.51	22.37	25.11	289.117
HIRRANMOYEE IMPORT	71.92	33.38	93.61	37.53	33.57	46.09	120.81	0.00	159.37	104.33	156.80	145.15	1002.554
CRECSENT POWER	25.88	26.83	25.73	24.27	24.97	25.42	24.87	25.94	26.78	25.22	24.29	26.23	306.426
IPCL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
TOTAL	**206.84**	**165.771**	**208.816**	**144.866**	**158.121**	**173.813**	**259.981**	**144.135**	**304.990**	**249.570**	**279.833**	**288.337**	**2585.069**
Teesta Low Dam Project U#3&4	53.02	117.40	185.20	199.64	202.98	200.82	139.11	83.21	37.84	28.91	25.835	48.80	1322.76
Haldia Energy Limited	389.33	350.22	333.66	377.82	385.29	363.40	377.99	291.35	308.26	187.42	221.84	361.86	3948.45
Grand Total Import	**649.19**	**633.39**	**727.68**	**722.32**	**746.39**	**738.03**	**777.08**	**518.70**	**651.08**	**465.91**	**527.51**	**699.00**	**7856.28**

EXPORT BY WEST BENGAL SETCL DURING 2021-22											ALL Figs in MU		
Calcutta Electric Supply Corporation	516.488	425.152	442.656	522.652	531.53	478.78	452.481	380.448	382.842	261.736	241.244	393.488	5029.497
Dishergarh Power Supply Company	61.24	63.14	63.38	67.95	71.82		56.27	73.90	82.46	85.28	75.66	70.14	771.23
Purilia Pump Storage Plant	80.84	116.04	144.07	118.22	156.14		119.13	119.42	144.66	132.69	151.52	124.65	1407.39
TOTAL	**658.57**	**604.34**	**650.10**	**708.83**	**759.49**	**478.78**	**627.87**	**573.77**	**609.96**	**479.71**	**468.43**	**588.28**	**7208.11**

ANNEXURE - IXA

Frequency Summary of the Eastern Region during the year 2021-22

Average Frequency (Hz) in different Periods of the Day

MONTH	< -----HOURS----->					
	00-05	**05-10**	**10-17**	**17-22**	**22-24**	**00-24**
April-21	49.99	50.00	49.98	49.99	49.96	49.99
May-21	49.98	50.01	49.99	49.99	49.98	49.99
June-21	50.00	50.00	50.00	49.98	49.97	49.99
July-21	50.00	50.00	50.00	49.98	49.99	50.00
August-21	49.99	49.99	49.99	49.97	49.98	49.99
September-21	50.00	50.01	50.00	49.99	50.00	50.00
October-21	49.98	49.99	49.97	49.98	49.96	49.98
November-21	49.98	49.98	49.99	49.99	49.99	49.99
December-21	50.00	49.98	49.99	49.99	50.00	49.99
January-22	49.99	49.99	49.99	50.00	49.99	49.99
February-22	49.99	49.99	49.99	50.00	49.98	49.99
March-22	49.97	49.98	49.96	49.97	49.94	49.97
MAXIMUM	**50.00**	**50.01**	**50.00**	**50.00**	**50.00**	**50.00**
MINIMUM	**49.97**	**49.98**	**49.96**	**49.97**	**49.94**	**49.97**
AVERAGE	**49.99**	**49.99**	**49.99**	**49.99**	**49.98**	**49.99**

ANNEXURE - IXB

Average Frequency in Percentage of the Time (%)including Max. & Min. Frquency during 2021-22

	Frequency Range (Hz) in % of Time			Instantaneous Frequency (Hz)						15 Minutes Integrated frequency (Hz)	
	<49.9	49.9-50.05	>50.05	MAX	Date	HRS.	MIN	Date	HRS.	MAX	MIN
April-21	7.97	75.06	16.97	50.29	04.04.21	18:01	49.69	11.04.21	21:07	50.15	49.75
May-21	6.65	74.50	18.86	50.28	01.05.21	18:02	49.63	28.05.21	22:39	50.18	49.73
June-21	6.10	74.53	19.37	50.27	04.06.21	18:03	49.64	24.06.21	14:22	50.19	49.73
July-21	5.35	75.05	19.60	50.26	20.07.21	13:07	49.51	06.07.21	22:12	50.21	49.71
August-21	7.68	76.92	15.40	50.22	01.08.21	13:06	49.53	26.08.21	19:18	50.18	49.70
September-21	4.18	77.01	18.81	50.23	10.09.21	13:04	49.50	24.09.21	18:42	50.16	49.61
October-21	11.10	74.38	14.52	50.29	26.10.21	13:02	49.50	07.10.21	18:14	50.21	49.63
November-21	8.02	74.09	17.89	50.27	28.11.21	6:01	49.63	08.11.21	06:54	50.16	49.69
December-21	6.92	73.14	19.95	50.34	20.12.21	2:03	49.65	26.12.21	10:10	50.29	49.74
January-22	5.84	75.66	18.51	50.28	16.01.22	22:00	49.65	15.01.22	09:09	50.19	49.74
February-22	5.97	76.89	17.14	50.26	06.02.22	18:03	49.54	22.02.22	07:15	50.14	49.64
March-22	14.50	73.41	12.09	50.30	03.03.22	6:01	49.54	22.03.22	22:21	50.13	49.59
MAXIMUM	14.50	77.01	19.95	50.34	20.12.2021	2:03	49.69	11.04.2021	21:07	50.29	49.75
MINIMUM	4.18	73.14	12.09	50.22	01.08.2021	13:06	49.50	07.10.2021	18:14	50.13	49.59
AVERAGE	7.52	75.05	17.43	50.27			49.58			50.18	49.69

Energy genertaion by various Power Plants and Plant Load Factor of Thermal Power Station of Eastern Region for the year 2021-22

SYSTEM	TYPE	POWER STATION	INSTALLED CAPACITY IN MW	EFFECTIVE CAPACITY IN MW	2021-22	
					Generation (MU)	PLF (%)
Bihar	*Theraml*	MTPS Stg-I	220.00	220.00	247.19	12.83
		Thermal Total	**220.00**	**220.00**	**247.19**	**12.83**
	RES		387.35	387.35	**315.60**	
Total BIHAR			**607.4**	**607.4**	**562.79**	
Jharkhand & JUVNL	Thermal	Tenughat TPS	420.00	420.00	1767.12	48.03
	Hydro	Subarnrekha	130.00	130.00	302.47	
	RES	RES	97.14	97.14	0.00	
		Total	**647.14**	**647.14**	**2069.59**	
DVC	*Thermal*	Chandrapura(U 7-8)	500.00	500.00	3816.85	87.14
		Durgapur/Waria(U #4)	210.00	210.00	215.12	11.69
		Mezia(U 1-6)	1340.00	1340.00	8190.96	69.78
		Mezia(U 7-8)	1000.00	1000.00	6408.20	73.15
		Durgapur Steel TPS (U 1-2)	1000.00	1000.00	6138.49	70.07
		Koderma STPS (U 1-2)	1000.00	1000.00	6930.29	79.11
		Raghunathpur (U 1-2)	1200.00	1200.00	6078.72	57.83
		Bokaro-A (U 1)	500.00	500.00	2996.85	68.42
		Thermal Total	**6750.00**	**6750.00**	**40775.48**	**68.96**
	Hydro	Maithon	63.20	63.20	221.42	
		Panchet	80.00	80.00	245.46	
		Tilaya	4.00	4.00	22.02	
		Hydro Total	**147.20**	**147.20**	**488.90**	
Total DVC			**6897.20**	**6897.20**	**41264.38**	
WBPDCL	*Thermal*	Bandel (1,2,5)	380.00	335.00	1730.09	58.95
		Santaldih(U 5-6)	500.00	500.00	3904.04	89.13
		Kolaghat	1260.00	1260.00	4271.63	38.70
		Bakreswar	1050.00	1050.00	8313.79	90.39
		Sagardighi TPS	1600.00	1600.00	11885.72	84.80
		DPL	550.00	550.00	2568.16	53.30
Total WBPDCL			**5340.00**	**5295.00**	**32673.43**	**70.44**
WBSEDCL	*Hydro*	Jaldhaka	35.00	35.00	178.13	
		Ramam	51.00	51.00	268.31	
		Teesta CF	67.50	67.50	72.69	
		Purulia PSP	900.00	900.00	1183.40	
Total WBSEDCL			**1053.50**	**1053.50**	**1702.53**	
	RES	RES	586.95	586.95	170.68	
Total (WBPDCL+WBSEDCL+RES)			**6,980**	**6,935**	**34546.64**	

NTPC, TTPS U-1 to U-6 (4x62.5+2x110) have been decommissioned on 01.04.2021.
WBPDCL, Bandel TPS U-1 (82.5 MW) has been decommissioned on 21.02.2022.
WBPDCL, Kolaghat TPS U-1 & U-2, each of capacity 210 MW, have been decommissioned on 21.02.2022.

Energy genertaion by various Power Plants and Plant Load Factor of Thermal Power Station of Eastern Region for the year 2021-22

SYSTEM	TYPE	POWER STATION	INSTALLED CAPACITY IN MW	EFFECTIVE CAPACITY IN MW	2021-22	
					Generation (MU)	PLF (%)
CESC	Thermal	Titagarh	240.00	240.00	0.00	0.00
		Southern	135.00	135.00	164.03	13.87
		Budge-Budge	750.00	750.00	5562.03	84.66
	Total CESC		**1125.00**	**1125.00**	**5726.06**	**58.10**
HEL	Thermal	Haldia	600.00	600.00	4275.64	81.35
	Total West Bengal (Incl. CESC & HEL)		**8705.45**	**8660.45**	**44548.34**	
Odisha	Thermal (OPGC)	IB TPS (U#1 &2)	420.00	420.00	2955.80	80.34
		IB TPS (U# 3)	660.00	660.00	3344.41	57.85
		IB TPS (U # 4)	660.00	660.00	3723.83	64.41
		Total Thermal	**1740.00**	**1740.00**	**10024.04**	**65.76**
	OHPC, HYDRO	Burla (Hirakud-I)	275.50	287.80	707.38	
		Chiplima (Hirakud-II)	72.00	72.00	268.23	
		Balimela	510.00	510.00	1062.08	
		Rengali	250.00	250.00	866.36	
		Upper Kolab	320.00	320.00	451.19	
		Indravati HPS	600.00	600.00	1156.64	
		Mckd.(Orissa dr)	57.38	57.38	277.30	
		Hydro Total	**2084.88**	**2097.18**	**4789.18**	
	RES	RES	607.09	607.09	700.24	
Total ODISHA (OPGC+ OHPC+RES)			**4431.97**	**4444.27**	**15513.46**	
Sikkim*	RES	Total	**56.79**	**56.79**	**17.00**	
NTPC	Thermal	FSTPS - I&II	1600.00	1600.00	9269.51	66.14
		FSTPS - III (U#6)	500.00	500.00	3151.67	71.96
		KhSTPP-I & II	2340.00	2340.00	16026.74	78.19
		TSTPP - I	1000.00	1000.00	7257.16	82.84
		BARH STPS -I	660.00	660.00	1700.12	76.66
		BARH STPS - II	1320.00	1320.00	7452.26	64.45
		Muzaffarpur Stg-II	390.00	390.00	2602.34	76.17
		BRBCL U#1,2,3	750.00	750.00	5164.04	78.60
		BRBCL U#4	250.00	250.00	536.53	62.97
		New Nabinagar STPP U#1,2	1320.00	1320.00	7921.39	68.51
		New Nabinagar STPP U#3			323.86	0.00
		Darlipali STPP U#1& U#2	1600.00	1600.00	9207.90	68.15
		NTPC, BTPS(U#6&7)	220.00	210.00	97.50	5.30
		NTPC, BTPS(U#8)	250.00	250.00	1588.08	72.52
		NTPC, BTPS (U#9)	250.00	250.00	725.09	80.03
Total NTPC			**12450.00**	**12440.00**	**73024.19**	**68.61**
	RES	Talcher Solar	10	10	12.85	
NHPC	Hydro	Rangit	60	60	**331.06**	
		Teesta HEP-V	510	510	**2647.48**	
		TLDP (NHPC)	292	292	**1322.76**	
Total NHPC			**862.00**	**862.00**	**4301.30**	
EASTERN REGION		THERMAL (exclud.. IPP)	**28645.00**	**28590.00**	**168513.15**	**66.48**
		HYDRO (exclud. IPP)	**4277.58**	**4289.88**	**11584.38**	
		RES(Small Hy+Solar)	**1745**	**1745**	**1216**	
IPP	Thermal	MPL (U 1&2)	1050	1050	7489.22	69.40
		APNRL (U 1&2)	540	540	3727.35	64.15
		GMR (U 1-2)	700	700	4880.62	78.60
		JITPL(U 1-2)	1200	1200	8559.41	56.47
		Total IPP (Thermal)	**3490**	**3490**	**24657**	**65.99**
	Hydro	CHUZACHEN (U 1-2)	110	110	507.79	
		JORTHANG (U# 1&2)	96	96	442.63	
		Teesta Urja St III	1200	1200	6257.96	
		DIKCHU(U 1-2)	96	96	484.49	
		TASHIDING (U 1-2)	97	97	451.15	
		RONGNICHU (U 1-2)	113	113	301.68	
		Total IPP (Hydel)	**1712.00**	**1712.00**	**8445.70**	
EASTERN REGION		THERMAL (INCL.. IPP)	**32135**	**32080**	**193170**	**68.02**
		HYDRO	**5990**	**6002**	**20030**	
		RES	**1745**	**1745**	**1216**	
		TOTAL(TH+HY+RES)	**39870**	**39827**	**214416**	
IMPORT FROM BHUTAN	Hydro	CHPC	360.00	270.00	1716.81	
		KHPS	60.00	60.00	122.22	
		TALA HPS	1020.00	1020.00	2740.27	
		DAGACHU	126.00	126.00	500.53	
		Mangdchhu HEP **	720.00	720.00	2860.48	
		Total Bhutan Import	**2286.00**	**2196.00**	**7940.31**	
GRAND TOTAL (TH+HY) INCLUDING IMPORT FROM BHUTAN					**222356.51**	

NTPC, Darlipali STPS U-2 (800 MW) has been commissioned on 01.09.2021.
NPGCL, New Nabinagar STPS U-2 (660 MW) has been commissioned on 23.07.2021.
NTPC, Barh Stg-I, U-1 (660 MW) has been commissioned on 12.11.2021.
BRBCL, Nabinagar TPS U-4 (250 MW) has been commissioned on 01.12.2021.
NTPC, Barauni TPS U-9 (250 MW) has been commissioned on 01.11.2021.

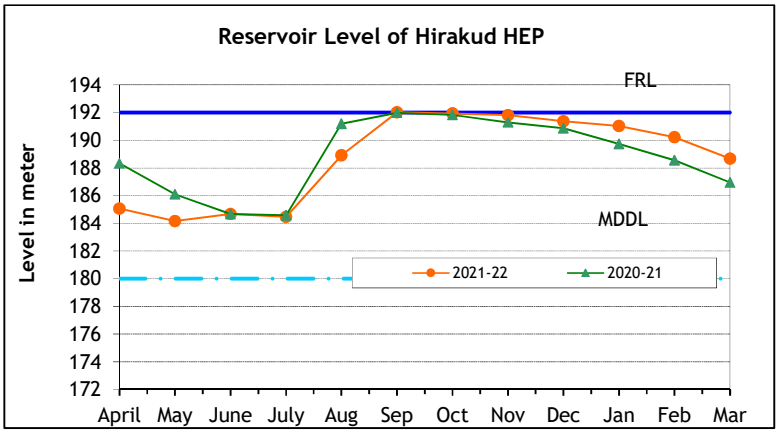
** All the figures considered above for operational data,need not to be used for any commercial purposes

Water Level in the Major Hydro Reservoir in the Region during 2021-22

(On last Day of the Month)

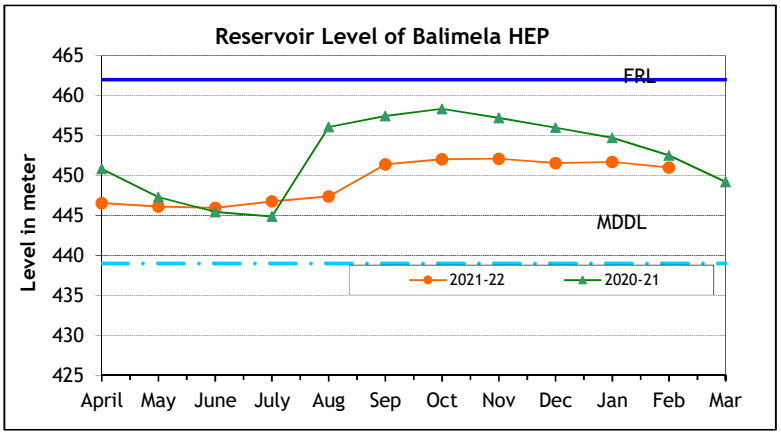
Reservoir Level of Hirakud HEP

Month	FRL	MDDL	2021-22	2020-21
April	192.00	180.00	185.06	188.34
May	192.00	180.00	184.16	186.11
June	192.00	180.00	184.68	184.68
July	192.00	180.00	184.47	184.58
Aug	192.00	180.00	188.91	191.2
Sep	192.00	180.00	192.02	191.99
Oct	192.00	180.00	191.95	191.83
Nov	192.00	180.00	191.81	191.29
Dec	192.00	180.00	191.38	190.87
Jan	192.00	180.00	191.03	189.74
Feb	192.00	180.00	190.23	188.56
Mar	192.00	180.00	188.68	186.96



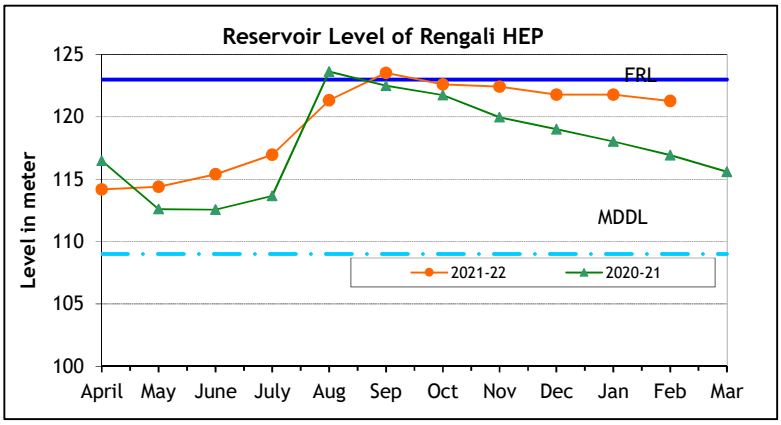
Reservoir Level of Balimela HEP

Month	FRL	MDDL	2021-22	2020-21
April	462.00	439.00	446.56	450.83
May	462.00	439.00	446.14	447.32
June	462.00	439.00	445.95	445.47
July	462.00	439.00	446.78	444.89
Aug	462.00	439.00	447.39	456.07
Sep	462.00	439.00	451.41	457.47
Oct	462.00	439.00	452.05	458.36
Nov	462.00	439.00	452.11	457.23
Dec	462.00	439.00	451.56	456.01
Jan	462.00	439.00	451.71	454.73
Feb	462.00	439.00	451.01	452.51
Mar	462.00	439.00	448.60	449.21



Reservoir Level of Rengali HEP

Month	FRL	MDDL	2021-22	2020-21
April	123.00	109.00	114.18	116.49
May	123.00	109.00	114.40	112.60
June	123.00	109.00	115.40	112.56
July	123.00	109.00	116.97	113.66
Aug	123.00	109.00	121.34	123.64
Sep	123.00	109.00	123.53	122.50
Oct	123.00	109.00	122.61	121.75
Nov	123.00	109.00	122.42	119.96
Dec	123.00	109.00	121.78	119.01
Jan	123.00	109.00	121.78	118.02
Feb	123.00	109.00	121.28	116.93
Mar	123.00	109.00	119.35	115.60



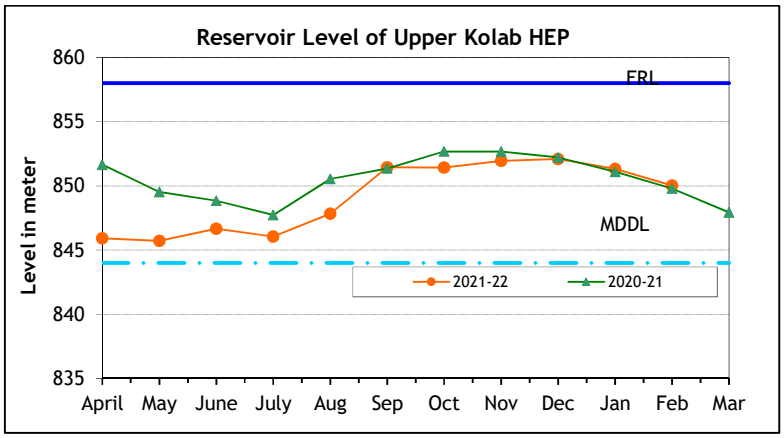
FRL: Full Reservoir Level; **MDDL**: Minimum Drawdown Level

Water Level in the Major Hydro Reservoir in the Region during 2021-22

(On last Day of the Month)

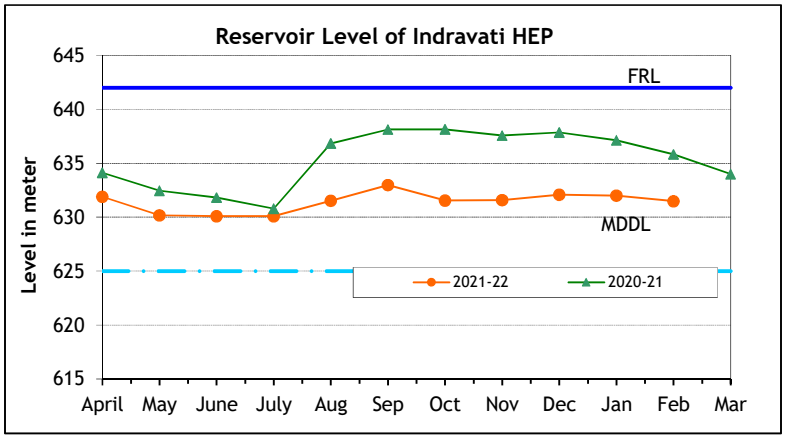
Reservoir Level of Upper Kolab HEP

Month	FRL	MDDL	2021-22	2020-21
April	858.00	844.00	845.92	851.66
May	858.00	844.00	845.72	849.52
June	858.00	844.00	846.66	848.84
July	858.00	844.00	846.06	847.73
Aug	858.00	844.00	847.83	850.54
Sep	858.00	844.00	851.44	851.36
Oct	858.00	844.00	851.42	852.68
Nov	858.00	844.00	851.95	852.66
Dec	858.00	844.00	852.09	852.22
Jan	858.00	844.00	851.33	851.09
Feb	858.00	844.00	850.03	849.79
Mar	858.00	844.00	848.01	847.94



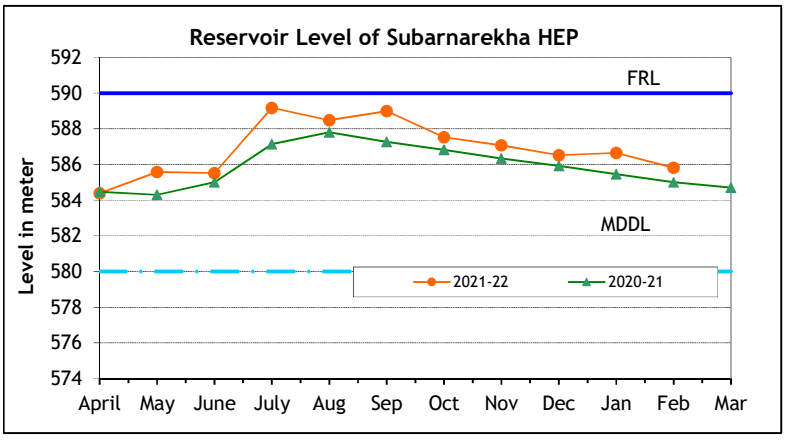
Reservoir Level of Indravati HEP

Month	FRL	MDDL	2021-22	2020-21
April	642.00	625.00	631.9	634.13
May	642.00	625.00	630.18	632.47
June	642.00	625.00	630.10	631.82
July	642.00	625.00	630.10	630.80
Aug	642.00	625.00	631.53	636.85
Sep	642.00	625.00	632.97	638.12
Oct	642.00	625.00	631.54	638.14
Nov	642.00	625.00	631.59	637.56
Dec	642.00	625.00	632.08	637.85
Jan	642.00	625.00	632.01	637.14
Feb	642.00	625.00	631.48	635.82
Mar	642.00	625.00	630.60	634.00



Reservoir Level of Subarnarekha HEP

Month	FRL	MDDL	2021-22	2020-21
April	590.00	580.00	584.39	584.48
May	590.00	580.00	585.58	584.30
June	590.00	580.00	585.52	585.00
July	590.00	580.00	589.18	587.14
Aug	590.00	580.00	588.48	587.81
Sep	590.00	580.00	589.00	587.26
Oct	590.00	580.00	587.53	586.83
Nov	590.00	580.00	587.08	586.34
Dec	590.00	580.00	586.53	585.92
Jan	590.00	580.00	586.65	585.46
Feb	590.00	580.00	585.83	585.00
Mar	590.00	580.00	585.03	584.70



FRL: Full Reservoir Level; **MDDL**: Minimum Drawdown Level

% Weighted Average Share Allocation for the Month of April, 2021 (First month of F.Y. 2021-22)

From	To	BENEFICIARIES (as per Excel)	BENEFICIARIES Name in DB (RLDC)	Region	FSTPP-I&II	FSTPP-III	KHSTPP-I	KHSTPP-II	TSTPP-I	BARH	BRBCL	MTPS-II	TEESTA	RANGIT	NPGC	Darlipali_NTPC
01-04-2021	30-04-2021	BIHAR	BSPHCL	ER	31.397866	21.517874	41.862887	4.979865	41.245379	90.758622	10.000	74.972	21.260	35.000	84.766	11.860
01-04-2021	30-04-2021	JHARKHAND	JHARKHAND	ER	8.574292	16.948474	3.202141	1.248565	7.667664	7.083029		3.433	12.340	13.330	3.276	9.220
01-04-2021	30-04-2021	DVC	DVC	ER	0.000000	0.000000	0.000000		0.200000			2.600	8.640	10.000		
01-04-2021	30-04-2021	ODISHA	ODISHA	ER	13.630000	16.620000	15.240000	2.050000	31.800000			8.527	20.590	0.000		58.820
01-04-2021	30-04-2021	ODISHA (COAL POWER - AFTAB)		ER	0.099049		0.098317	0.106629	0.099049							
01-04-2021	30-04-2021	ODISHA (COAL POWER - DADRI)		ER	0.082937	0.162663	0.082325	0.089285	0.082937							
01-04-2021	30-04-2021	ODISHA (COAL POWER - Rajasthan)		ER	0.275736	0.183824	0.275927	0.275736	0.275736							
01-04-2021	30-04-2021	ODISHA (COAL POWER - Raj-II SunTech)		ER		0.091912										
01-04-2021	30-04-2021	ODISHA (COAL POWER - Faridabad)		ER	0.095840	0.091354	0.078707	0.098967	0.086460							
01-04-2021	30-04-2021	WEST BENGAL	WEST_BENGAL	ER	31.930000	37.638940	6.070000	0.000000	9.210000			9.635	23.980	28.340		18.350
01-04-2021	30-04-2021	West Bengal (COAL POWER - Rajasthan)		ER	0.919117	0.643382	0.919756	0.919117	0.919117							
01-04-2021	30-04-2021	West Bengal (COAL POWER- Raj-II SunTech)		ER		0.275735										
01-04-2021	30-04-2021	SIKKIM	SIKKIM	ER	0.000000		0.000000	0.000000	0.000000	1.318057		0.554	13.190	13.330	0.546	0.000
01-04-2021	30-04-2021	RLY BIHAR	BSPHCL_RAIL	ER							12.097					
01-04-2021	30-04-2021	RLY DVC	DVC-Railway	ER							13.306					
01-04-2021	30-04-2021	TELANGANA (NSM-II)	TSTRANSCO	SR	0.751558	0.733930	0.682624	0.763112	0.712870	0.676151		0.279				
01-04-2021	30-04-2021	TAMILNADU	TNEB	SR	1.290000		0.700000		0.850000							
01-04-2021	30-04-2021	CHHATTISGARH	CSEB_Beneficiary	WR				2.000000								
01-04-2021	30-04-2021	GUJARAT	GEB	WR	1.630000	5.000000	1.550000	9.730000	2.400000							1.750
01-04-2021	30-04-2021	MADHYA PRADESH	MPSEB_Beneficiary	WR				4.930000								
01-04-2021	30-04-2021	MAHARASHTRA	MSEB_Beneficiary	WR				9.870000								
01-04-2021	30-04-2021	DADRA & NAGAR HAVELI	DNH_Beneficiary	WR				0.200000								
01-04-2021	30-04-2021	DAMAN & DIU	DD_Beneficiary	WR				0.130000								
01-04-2021	30-04-2021	RLY MADHYA PRADESH	WCR_IR_MP	WR							18.629					
01-04-2021	30-04-2021	RLY MAHA RASHTRA	CR_IR_MS	WR							14.516					
01-04-2021	30-04-2021	UTTAR PRADESH	UPPCL	NR	2.080000		9.120000	16.730000							11.412	
01-04-2021	30-04-2021	HARYANA	HARYANA	NR	0.690000		3.040000	4.580000								
01-04-2021	30-04-2021	RAJASTHAN	RAJASTHAN	NR	0.690000		3.040000	7.110000			1.210					
01-04-2021	30-04-2021	J & K	JK&LADAKH	NR	0.850000		3.680000	5.560000								
01-04-2021	30-04-2021	HIMACHAL PRADESH	HP	NR				1.530000								
01-04-2021	30-04-2021	DELHI	DELHI	NR	1.390000		6.070000	10.490000	0.000000		0.605					
01-04-2021	30-04-2021	PUNJAB	PUNJAB	NR				8.020000			4.234					
01-04-2021	30-04-2021	UTTARAKHAND	UTTARAKHAND	NR	0.000000		0.000000	1.870000								
01-04-2021	30-04-2021	CHANDIGARH	CHANDIGARH	NR	0.000000		0.000000	0.200000								
01-04-2021	30-04-2021	RLY UTTAR PRADESH(ISTS Points)		NR							6.653					
01-04-2021	30-04-2021	UTTAR PRADESH		NR							15.725					
01-04-2021	30-04-2021	HARYANA	HARYANA	NR							1.815					
01-04-2021	30-04-2021	ASSAM	Assam_Ben	NER	2.455737		2.106025	5.093479	2.095419							
01-04-2021	30-04-2021	ASSAM (COAL POWER - Rajasthan)		NER	0.091912	0.091912	0.091976	0.091912	0.091912							
01-04-2021	30-04-2021	MEGHALAYA	Meghalaya_Ben	NER	0.000000											
01-04-2021	30-04-2021	NAGALAND	Nagaland_Ben	NER	0.429803		0.424741		0.424823							
01-04-2021	30-04-2021	ARUNACHAL PRADESH	Arunachal_Ben	NER	0.191917		0.191880		0.196898							
01-04-2021	30-04-2021	MIZORAM	Mizoram_Ben	NER	0.141736		0.141708		0.141736							
01-04-2021	30-04-2021	NVVN POWER - A/C BPDB	BANGLADESH	Others	0.312500		1.191303	1.333333	1.500000							
01-04-2021	30-04-2021	POWERGRID (PUSAULI)		Others			0.139683			0.164141						
01-04-2021	30-04-2021	KARNATAKA_RLY	SWR_IR_KPTCL	SR							1.21					

% Weighted Average Share Allocation for the Month of March, 2022 (Last month of F.Y. 2021-22)

From	To	BENEFICIARIES (as per Excel)	BENEFICIARIES Name in DB (RLDC)	Region	FSTPP-I&II	FSTPP-III	KHSTPP-I	KHSTPP-II	TSTPP-I	BARH	BRBCL	MTPS-II	TEESTA	RANGIT	NPGC	Darlipali_NTPC	BARH-I
01-03-2022	31-03-2022	BIHAR	BSPHCL	ER	31.397866	21.517874	41.872575	4.979865	41.245379	90.803247	10.000	74.9723	21.260	35.000	84.766000	11.860	60.906
01-03-2022	31-03-2022	JHARKHAND	JHARKHAND	ER	8.574292	15.900087	3.204922	1.248565	7.667664	6.695544		3.2330	12.340	13.330	2.747678	9.220	11.342
01-03-2022	31-03-2022	DVC	DVC	ER	0.000000	0.000000	0.000000		0.200000			2.4323	8.640	10.000			
01-03-2022	31-03-2022	ODISHA	ODISHA	ER	0.000000	16.620000	0.000000	2.050000	31.800000			8.0303	20.590	0.000		58.820	11.897
01-03-2022	31-03-2022	ODISHA (COAL POWER - AFTAB)		ER	0.099049		0.098455	0.106629	0.099049								
01-03-2022	31-03-2022	ODISHA (COAL POWER - DADRI)		ER	0.082937	0.162663	0.082440	0.089285	0.082937								
01-03-2022	31-03-2022	ODISHA (COAL POWER - Rajasthan)		ER	0.275736	0.183824	0.276311	0.275736	0.275736								
01-03-2022	31-03-2022	ODISHA (COAL POWER - Raj-II SunTech)		ER		0.091912											
01-03-2022	31-03-2022	ODISHA (COAL POWER - Faridabad)		ER	0.095840	0.091354	0.078817	0.098967	0.086460								
01-03-2022	31-03-2022	WEST BENGAL	WEST_BENGAL	ER	31.930000	37.638940	6.070000	0.000000	9.210000			9.0733	23.980	28.340		18.350	0.000
01-03-2022	31-03-2022	West Bengal (COAL POWER - Rajasthan)		ER	0.919117	0.643382	0.921034	0.919117	0.919117								
01-03-2022	31-03-2022	West Bengal (COAL POWER- Raj-II SunTech)		ER		0.275735											
01-03-2022	31-03-2022	SIKKIM	SIKKIM	ER	0.000000		0.000000	0.000000	0.000000	1.234926		0.5180	13.190	13.330	0.464532	0.875	2.135
01-03-2022	31-03-2022	RLY BIHAR	BSPHCL_RAIL	ER							10.989						
01-03-2022	31-03-2022	RLY DVC	DVC-Railway	ER							12.088						
01-03-2022	31-03-2022	TELANGANA (NSM-II)	TSTRANSCO	SR	0.751558	0.733930	0.683572	0.763112	0.712870	0.678453		0.2793					
01-03-2022	31-03-2022	TAMILNADU	TNEB	SR	1.290000		0.700000		0.850000	0.474194		1.4615					0.782
01-03-2022	31-03-2022	CHHATTISGARH	CSEB_Beneficiary	WR				2.000000									
01-03-2022	31-03-2022	GUJARAT	GEB	WR	15.371290	6.048387	16.790000	9.730000	2.400000						0.609790	0.875	12.938
01-03-2022	31-03-2022	MADHYA PRADESH	MPSEB_Beneficiary	WR				4.930000									
01-03-2022	31-03-2022	MAHARASHTRA	MSEB_Beneficiary	WR				9.870000									
01-03-2022	31-03-2022	DADRA & NAGAR HAVELI	DNH_Beneficiary	WR				0.200000									
01-03-2022	31-03-2022	DAMAN & DIU	DD_Beneficiary	WR				0.130000									
01-03-2022	31-03-2022	RLY MADHYA PRADESH	WCR_IR_MP	WR							22.967						
01-03-2022	31-03-2022	RLY MAHA RASHTRA	CR_IR_MS	WR							13.187						
01-03-2022	31-03-2022	UTTAR PRADESH	UPPCL	NR	2.080000		9.120000	16.730000							11.412000		
01-03-2022	31-03-2022	HARYANA	HARYANA	NR	0.690000		3.040000	4.580000			0.000						
01-03-2022	31-03-2022	RAJASTHAN	RAJASTHAN	NR	0.578710		3.040000	7.110000			1.099						
01-03-2022	31-03-2022	J & K	JK&LADAKH	NR	0.850000		3.680000	5.560000									
01-03-2022	31-03-2022	HIMACHAL PRADESH	HP	NR				1.530000									
01-03-2022	31-03-2022	DELHI	DELHI	NR	1.390000		6.070000	10.490000	0.000000		1.648						
01-03-2022	31-03-2022	PUNJAB	PUNJAB	NR	0.000000	0.000000	0.000000	8.020000		0.000000	3.846				0		
01-03-2022	31-03-2022	UTTARAKHAND	UTTARAKHAND	NR	0.000000		0.000000	1.870000									
01-03-2022	31-03-2022	CHANDIGARH	CHANDIGARH	NR	0.000000		0.000000	0.200000									
01-03-2022	31-03-2022	RLY UTTAR PRADESH(ISTS Points)		NR							6.044						
01-03-2022	31-03-2022	UTTAR PRADESH		NR							10.440						
01-03-2022	31-03-2022	HARYANA	HARYANA	NR							6.044						
01-03-2022	31-03-2022	ASSAM	Assam_Ben	NER	2.455737		2.108380	5.093479	2.095419		0.549						
01-03-2022	31-03-2022	ASSAM (COAL POWER - Rajasthan)		NER	0.091912	0.091912	0.092104	0.091912	0.091912								
01-03-2022	31-03-2022	MEGHALAYA	Meghalaya_Ben	NER	0.000000												
01-03-2022	31-03-2022	NAGALAND	Nagaland_Ben	NER	0.429803		0.425332		0.424823								
01-03-2022	31-03-2022	ARUNACHAL PRADESH	Arunachal_Ben	NER	0.191917		0.192147		0.196898								
01-03-2022	31-03-2022	MIZORAM	Mizoram_Ben	NER	0.141736		0.141905		0.141736								
01-03-2022	31-03-2022	NVVN POWER - A/C BPDB	BANGLADESH	Others	0.312500		1.192958	1.333333	1.500000								
01-03-2022	31-03-2022	POWERGRID (PUSAULI)	HVDC_PUSAULI	Others			0.119048			0.000000							
01-03-2022	31-03-2022	POWERGRID (ALIPURDUAR)	HVDC_APD							0.113636							
01-03-2022	31-03-2022	KARNATAKA_RLY	SWR_IR_KPTCL	SR							1.099						

ANNEXURE-XIII

GRID DISTURBANCES

Grid disturbances which occurred during the year 2021-22 are as follows:

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
1.	OPTCL	08/04/2021	13:47	100	560	GD-I	220 KV Budhipadar-Lapanga ckt-1&2 tripped followed by tripping of Budhipadar-Raigarh due to B phase fault.. Subsequently a bus fault was created at BUS-1 (with snapping of R-Ph pipe bus from isolator to Breaker of 220KV Budhipadar- Tarkera Ckt-2). All the remaining feeders with Bus -1 tripped. Now as only Korba 3 is the only available path for evacuation of all generation hence it also tripped on power swing. Vadanta formed Island with its own CPP load but due to excess generation over frequency occurred and also all generators tripped on Over frequency.
2.	JUSNL	08/04/2021	17:39	40	0	GD-I	At 17:39 hrs 220 kV Daltongunj – Garwah 2 tripped on B-N fault and at 17:43 Hrs, ckt-1 also tripped on B-n fault with same relay indication as of ckt-2.
3.	ISTS	08/04/2021	15:53	37	28	GD-I	At 15:53 hrs all four running ICTs 1,3,4,5 at Rangpo tripped from HV side on backup impedance protection with inter trip to LV side. So at that time Only running unit of Tashiding 28 Mw along with 37 mw of Gangtok load islanded and did not survived due to large imbalance.
4.	Jorethang HEP	09/04/2021	17:47	0	36		220 kV Rangpo – New Melli S/C tripped from Rangpo end in Zone-1 and same fault was sensed by 220 kV Tashding –New Melli and this line also tripped from Tashding end in zone-3 due to non-clearance of fault from New melli end. 220 kV Rangpo-Tashding S/C also

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	tripped on the same time on R-Y phase fault encroaching the same fault from Rangpo end in Zone-3. As a result, around 36 MW generation loss occurred at Jorethang HEP due to loss of evacuation path.
5.	BSPTCL	15/04/2021	16:08	120	0	GD-I	220KV Chandauti-Sonenager D/C tripped at 16:08 hrs led to total power failure at GSS Sonenagar (BSEB). As reported by SLDC Bihar, during relay testing of upcoming 160 MVA Transformer -3 at Sonenagar (GSS) by Siemens relay engineer, LBB protection operated which resulted tripping of both the lines.
6.	Tashiding HEP	16/04/2021	16:46	0	0	GD-I	220kV Tashiding substation is having only two interconnections ,220 kV Tashiding-New melli S/C and 220 kV Tashiding -Rangpo S/C. At 16:46, 220 KV New Melli- Tashiding tripped on 3 phase fault. At the same time, 220 KV Rangpo-Tashiding also tripped from Rangpo end on same 3 phase fault isolating 220 KV Tashiding station, though there was no generation loss as it had no schedule.
7.	JUSNL	21/04/2021	15:40	40	0	GD-I	220 kV Daltongunj – Garwah 1 & 2 tripped on B-N fault.
8.	JUSNL	21/04/2021	17:42	120	0	GD-I	220kV Farakka- Lalmatia, 132kV Kahalgaon (NTPC)-Lalmatia & 132kV Kahalgaon (BSPTCL)- Lalmatia tripped at 17:42 hrs. 17:52 hrs & 17:58 hrs respectively due to bad weather (storm and heavy rain). Tower collpase reported for 220 kV Godda- Lalmatia D/C and 220 kV Farakka Lalmatia S/C.
9.	Teesta III/Dikchu	23/04/2021	13:21	0	148		At 13:21, 400 kV Teesta-3-Kishangunj tripped on B-phase fault. At the same time,400 kV Teesta-3 -Dikchu also tripped on same fault. As a result, around 148 MW generation loss occurred at TEESTA Ill due to loss of

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	evacuation path. There was no generation at Dikchu.
10.	JUSNL	29/04/2021	13:30	35	0	GD-I	At 12:34 hrs 220kV Daltongunj-Garwah (New) -2 tripped on B-Earth fault during restoration of said line after necessary checking (as line is frequently tripping from last few days) 220kV Daltongunj-Garwah (New)-1 also tripped on B-Earth fault at 13:30 hrs leading to power failure at 220kV Garwah substation.
11.	JUSNL	29/04/2021	22:37	20	0	GD-I	At 22:37 Hrs, 220 KV Daltonganj-Garwah (New)-2 tripped on R-Y-Earth fault leading to power failure at 220/132 Garwah (New) S/s (220 KV Daltonganj-Garwah (New)-I was already under tripped condition).
12.	JUSNL	15/05/2021	12:01	185	0	GD-I	Due to tower collapse of 220 kV Farakka-Lalmatia S/C in April 2021, local load at 220 kV Dumka and Godda S/S were being radially fed from 400/220 kV Maithon S/S through 220 kV Maithon-Dumka D/C and 220 kV Dumka-Godda D/C. Shutdown of 220 kV Maithon Dumka – 1 was taken by JUSNL at 10:51 hrs to attend rectify red hot at connector of R- phase pole of circuit breaker of the line. Hence load at Dumka was fed through 220 kV Maithon Dumka – 2. At 12:02 hrs 220 kV Maithon Dumka – 2 tripped on R phase to earth fault resulting in total power failure at Goda, Dumka S/S and nearby areas.
13.	BSPTCL	17/05/2021	23:06	150	0	GD-I	On 17-05-2021, 220 kV Gaya-Bodhgaya-1 & 2 tripped at 23:06 hrs from Gaya end only. At that moment, all 220/132 KV ICTs at Bodhgaya also tripped, causing load loss of 150 MW at Chandauti, Sherghati, Imamganj, Rafiganj Traction & Bodhgaya. 220 KV Bodhgaya-Khijasarai D/C was hand-tripped from

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							Bodhgaya end
14.	BSPTCL	20/05/2021	03:41	92	0	GD-I	220 kV Chandauti-Sonenagar D/C tripped from Chandauti end. This has led to total power failure at 220/132 kV Sonenagar (BSPTCL) and radially connected 132 kV substations. At the same time 132 kV Sonenagar – Japla S/C also got tripped.
15.	OPTCL	23/05/2021	10:17	100	0	GD-I	All 220 kV feeders connected to 220/132 kV Joda S/S got tripped due to operation of bus bar protection. This has resulted in total power failure at 220/132 kV Joda and 220 kV TSIL S/S and loss of 100 MW load.
16.	JUSNL	27/05/2021	10:13	30	0	GD-I	On 26-05-2021 and 27-05-2021, demand in Jharkhand system was low because of thunderstorm and heavy rainfall caused by Cyclone Yaas and subsequent depression. As a result, high voltage has been observed at various parts of JUSNL network. At 03:22 hrs of 27th may 2021, 220 kV Dumka-Jasidih D/C were hand tripped at Dumka end because of overvoltage. Charging of 220 KV Dumka-Jasidih – 1 was attempted at 03:51 Hrs and 07:01 Hrs however it wasn't successful. Finally, it was charged at 09:50 Hrs.
17.	BSPTCL	27/05/2021	23:22	5	0	GD-I	220 kV Khagaria S/S is radially connected to New Purnea S/S through 220 kV Khagaria-New Purnea-2. On 27-05-2021, demand in Bihar was low because of thunderstorm and heavy rainfall due to depression caused by Cyclone Yaas. At 23: 22 hrs 220 kV Khagaria-New Purnea-2 tripped due to Y-B fault resulting in total power failure at Khagaria S/S.
18.	OPTCL/OHPC	28/05/2021	07:45	0	0		On 28-05-2021 at 07:45 hrs, due to CVT failure of 220 kV Rengali-TSTPP S/C at Rengali end, all 220 kV lines connected to 220 kV Rengali (OPTCL) S/S and 220 kV

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	Rengali PH got tripped. Y phase jumper snapping of 220 kV Rengali-Rengali – 2 at 220 kV Rengali (OPTCL) Bus A was also reported at the same time. The event has led to total power supply failure at 220 kV Rengali Hydropower station and 220 kV Rengali (OPTCL) S/s.
19.	BSPTCL	01/06/2021	11:56	80	0	GD-I	220 kV Chandauti-Sonenagar D/C tripped at 11:56 hrs on 01 - 06 - 2021 leading to total power failure at 220/132 kV Sonenagar (BSPTCL) and radially connected 132 kV substations.
20.	BSPTCL	01/06/2021	17:03	133	133	GD-I	On 01-06-2021 at 17:12 hrs 220 kV Hazipur – BTPS ckt- 1, 220 kV Mokama – BTPS 2, 220 kV BTPS-Begusarai D/C, 220 kV Begusarai – Purnea(PG) ckt -I, 220 kV Begusarai Khagaria ckt -2, 220 kV Begusarai-New Samastipur (Ujiyarpur) D/C and 220 kV Mokama(BGCL)-Biharshariff D/C tripped resulting in total power failure at BTPS.
21.	BSPTCL	01/06/2021	17:10	180	0	GD-I	All 220 kV lines, emanating from 220 kV Biharshariff (Bihar) tripped. It was reported that R phase CT at LV side of 400/220 kV ICT- 2 busted out resulting to tripping of all emanating lines.
22.	BSPTCL	07/06/2021	13:15	120	0	GD-I	220KV Chandauti –Sonenagar (BSEB) D/C tripped on Y-B fault at 13:15 hrs leading to total power failure at 220/132/33 kV Sonenagar in BSPTL system.
23.	BSPTCL	09/06/2021	20:46	300	0	GD-I	At 20:46 hrs blast occurred in Y-phase bus coupler CT at 220kV Hazipur S/S leading to operation of bus-bar protection and both bus becoming dead along with tripping of all outgoing lines emanating from S/S.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
24.	BSPTCL	21/06/2021	11:15	104	0	GD-I	220KV Chandauti –Sonenagar (BSEB) D/C tripped on Y phase to earth fault at 11:15 hrs leading to total power failure at 220/132/33 kV Sonenagar in BSPTL system.
25.	BSPTCL	24/06/2021	13:42	80	0	GD-I	220 kV Chandauti - Sonenagar - 1 was under shutdown. At 13:42 hrs, 220 kV Chandauti - Sonenagar - 2 tripped from Chanduati (PMTL) end resulting in total power failure at 220/132 KV G.S.S Sonenagar (new) end leading to load loss of 80 MW at S'Nagar & Aurangabad at Bihar system.
26.	Tashiding HEP	25/06/2021	04:54	0	90	GD-I	220 kV Tashiding – Rangpo S/C and 220KV Tashiding-New Melli S/C tripped at 04:54 hrs on Y-B fault resulting in tripping of Tashiding unit # 1 and unit # 2 due to loss of evacuation path.
27.	BSPTCL	25/06/2021	16:04	94	0	GD-I	On 25-06-2021, 220 kV Chandauti – Sonenagar – 1 was under shutdown for maintenance. 220 kV Chandauti – Sonenagar – 2 tripped at 16:04 hrs from Chandauti end due to R phase to earth fault. Due to obstruction in operation of main breaker at Chandauti end, LBB operated for Chandauti 220 kV bus 2. As a result, 220 kV main bus 2 at Chandauti along with elements connected to 220 kV bus 2 at Chandauti i.e. 400/220 kV 500 MVA ICT 3 at Chandauti and 220/132 kV 200 MVA ICT 1 & 2 at Chandauti also got tripped.
28.	BSPTCL	30/06/2021	19:13	203	0	GD-I	220 kV Chandauti - Sonenagar - 2 was under shutdown. At 19:13 hrs, 220 kV Chandauti - Sonenagar - 1 tripped from Sonenagar end only due to back up protection operation. As a result total power failure occurred at Sonenagar, Aurangabad, Japla, Kudra and nearby area.
29.	Rongnichu HEP	14/07/2021	11:27	0	73		At 11:27 hrs, 220 kV Rangpo- Rongnichu-1 tripped from Ronginchu end leading to loss of evacuation path for Ronginchu HEP.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	
30.	WBSETCL	14/07/2021	11:54	185	0	GD-I	On 14-07-2021 at 11:54 hrs both buses at 220 kV New Town AA-III S/S tripped due to operation of bus bar protection leading to load loss in New town region and corresponding tripping of associated transmission lines..
31.	Rongnichu HEP	15/07/2021	01:38	0	80	GD-I	At 01:38 hrs 15-07-2021, 220 kV Rangpo-Rongnichu-1 tripped from Rongnichu end due to overcurrent relay operated. Both running units at Rongnichu HEP tripped due to loss of evacuation path as circuit II was already under shutdown.
32.	BSPTCL	16/07/2021	19:04	157	0	GD-I	220 kV Chandauti-Sonenagar D/C tripped due to operation of LBB during testing of 220/132 kV ICT-3 at Sonenagar and 220/132 kV Sonenagar S/S became dead.
33.	DVC	18/07/2021	19:37	254	0	GD-I	Bus differential protection of 220 kV Bus 1&2 at Bokaro TPS- B operated. Consequently, 220 kV Bus I & Bus II at Bokaro TPS -B tripped, leading to total power failure at 220/132 kV Bokaro S/S, 220/132 kV Ramgarh, 132 kV Patratu, 132 kV North Karnpura.
34.	BGCL	25/07/2021	19:05	300	0	GD-I	220kV Gaya-Khizisarai-1 tripped in Y-Earth fault from Khizisarai end and at the same time 220kV Biharshariff-Khizisarai-D/C also tripped in R-Y-Earth fault.
35.	OHPC	27/07/2021	08:57	0	178	GD-I	All feeder connected to Rengali PH tripped along with Units 1, 2, 4 and 5 due to earth fault and overcurrent in the downstream of 33kV system at Rengali PH.
36.	DVC	28/07/2021	02:26	140	0		220 kV Parulia DVC –Durgapur STPS (Andal)-1 tripped in R-Y-Earth fault followed by tripping of 220 kV Parulia DVC-Parulia PG D/C and Parulia DVC – Durgapur STPS (Andal)-2 in Y-Earth fault at 02:26 hrs.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	220 kV Parulia DVC –Muchipara D/C were already in open condition leading to complete blackout of 220 kV Parulia DVC S/S along with interruption of power supply at DSP (Tamla) affecting power failure at oxygen plant as well.
37.	BSPTCL	28/07/2021	07:32	211	0	GD-I	At 07:32 hrs fire hazard occurred in R-phase bushing of 160MVA ICT-2 at 220kV Darbhanga(BSEB) S/S leading to tripping of 220kV Darbhanga(DMTCL)-Darbhanga(BSEB) D/C. Load loss of around 220MW in adjoining areas of Madhubani,Pandor and Jaynagar.
38.	BSPTCL	31/07/2021	12:13	12	0	GD-I	220 kV Chandauti Sonenagar D/C tripped due to bus bar opeation of bus -1 at Sonenagar. Both the circuits were connected to bus bar 1 at Sonenagar.
39.	BSPTCL	06/08/2021	15:28	150	0	GD-I	220 kv Bus I at Sonenagar tripped on mal-operation of bus bar protection. 220 kv Bus II at Sonenagar is not available. 220 kv Chandauti-Sonenagar D/c tripped, leading to load loss of around 150 MW at Sonenagar, Aurangabad and Rafiganj.
40.	OPTCL	11/08/2021	13:34	150	0	GD-I	220 kv Bus I at TTPS tripped. 220 kv Bus II & 220 kv TTPS-Meeramundali II was under shutdown. All lines emanating from TTPS tripped. Around 150 MW load loss occurred at Chainpal, Duburi and Angul.
41.	JUSNL	03/09/2021	21:52	200	0	GD-I	At 21:52 hrs, Bus PT of 220 kV Bus-2 at Ramchandrapur burst, leading to tripping of both 220 kV buses at Ramchandrapur. This led to total power failure at Ramchandrapur.
42.	JUSNL	12/09/2021	16:01	15	0		At 16:01 hrs, total power supply failure occurred at 220/132 kV Patratu (PTPS) S/s.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	
43.	OHPC/OPTCL	18/09/2021	17:59	0	73	GD-I	At 17:59 hrs, while synchronizing U#2 at UpperKolab all three circuits emanating from 220 kV UpperKolab HEP tripped and 220 kV bus became dead.
44.	JUSNL	26/09/2021	15:31	34	0	GD-I	220 kV Daltonganj-Garwah (New) D/c tripped on B_N fault leading to total power failure at 220/132 kV Garwah (New) S/s.
45.	BSPTCL	28/09/2021	17:18	230	0	GD-I	Both 220 kV Buses at Hazipur tripped due to operation of LBB of 220 kV Hazipur-Amnour-II which led to total power failure at Hazipur and Amnour.
46.	DVC	29/09/2021	01:24	150	0	GD-I	At 01:24 hrs, total power failure occurred at 220/132 kV Ramgarh, 132 kV Patratu S/s and 132 kV North Karnpura S/s.
47.	BSPTCL	29/09/2021	11:28	140	0	GD-I	220 kV Hazipur-Amnour-1 tripped due to operation of bus bar protection at Hazipur. Total power failure occurred at Amnour as it was being through only feeder of 220 kV Hazipur-Amnour-1.
48.	Dikchu HEP	06/10/2021	12:38	0	55	GD-I	At 12:38 Hrs, 400 KV Teesta III-Dikchu & 400 kV Dikchu-Rangpo tripped. Consequently, 400 kV Dikchu S/s became dead, one running unit at Dikchu tripped due to loss of evacuation path and 55 MW generation loss occurred.
49.	OPTCL	09/10/2021	11:57	115	600	GD-I	At 11:57 Hrs, both 220 kV Bus at Budhipadar tripped, leading to total power failure at 220/132 kV Budhipadar S/s, 220 kV IB Thermal, 220 kV Vedanta.
50.	JUSNL	09/10/2021	12:44	15	0	GD-I	At 12:44 Hrs, 220 kV Daltonganj-Chatra D/c tripped on B-phase to earth fault leading to total power failure at 220/132 kV Chatra S/s.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
51.	JUSNL	09/10/2021	18:49	43	0	GD-I	220 kV Daltonganj-Garhwa(New) D/c tripped on B-phase to earth fault leading to total power failure at 220/132 kV Garhwa(New) S/s.
52.	Rongnichu HEP	20/10/2021	12:42	0	103	GD-I	At 12:42 Hrs, 220 kV Rangpo-Rongnichu D/c tripped. Both running units at Rongnichu tripped due to loss of evacuation path. Total 103 MW generation loss occurred.
53.	TUL	21/10/2021	14:32	0	1086	GD-I	400 KV Teesta III-Dikchu tripped on B_N fault. This led to loss of evacuation for generation at Teesta III as 400 kV Teesta III-Kishanganj was already under tripped condition since 13:47 Hrs. 1086 MW generation loss occurred due to tripping of all running units at Teesta III.
54.	OPTCL	30/11/2021	10:12	82	348	GD-I	220 kV Bus-2 at Budhipadar tripped due to a bus fault at Budhipadar. Isolator dropper of 220 kV Budhipadar-Lephripara at Budhipadar snapped and created bus fault. This led to total loss of power in 220 kV side of 220/132 kV Budhipadar S/s. 220 kV IBTPS also became dead.
55.	BSPTCL	15/12/2021	15:28	101	0	GD-I	At 15:28 Hrs, 220 kV Chandauti-Sonenagar-1 tripped from both end on R_Y fault. At the same time, 220 kV Chandauti-Sonenagar-2 also tripped on R_Y fault from Chandauti end. This led to total power failure at 220/132 kV Sonenagar S/s.
56.	OPTCL	21/12/2021	19:38	450	0	GD-I	At 19:38 Hrs, both 220 kV Bus at Tarkera became dead resulting in total power failure at Rourkela, RSP (Rourkela Steel Plant)& Rajgangpur.
57.	TVNL	01/01/2022	05:58	0	320	GD-I	All emanating lines from 220 kV Tenughat (TVNL) tripped. Two running units at Tenughat also tripped.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
58.	JUSNL	02/01/2022	04:29	51	0	GD-I	220 kV Daltonganj-Garhwa(New)-1 tripped on Y-phase to earth fault. At the same time, 220 kV Daltonganj-Garhwa(New)-2 tripped on R-phase to earth fault, leading to total power failure at 220/132 kV Garhwa(New) S/s.
59.	TUL	04/01/2022	13:14	0	0	GD-I	At 13:14 Hrs, 400 kV Teesta 3-Dikchu tripped on O/V at Dikchu and DT sent to Teesta-3.
60.	TUL	05/01/2022	12:58	0	0	GD-I	At 12:58 Hrs, 400 kV Teesta 3-Dikchu tripped on O/V at Dikchu and DT sent to Teesta-3.
61.	TUL	14/01/2022	13:01	0	0	GD-I	At 13:01 Hrs, 400 kV Teesta 3-Dikchu tripped on O/V at Dikchu and DT sent to Teesta-3. 400 kV Dikchu S/s became dead as 400 kV Rangpo-Dikchu was under planned shutdown.
62.	TUL	16/01/2022	14:01	0	0	GD-I	400 kV Teesta 3-Dikchu tripped at Dikchu end on O/V protection. At the same time, 400 kV Teesta 3-Kishanganj also tripped at Teesta 3 on O/V.
63.	BSPTCL	17/01/2022	13:13	147	0	GD-I	At 13:13 hrs, all lines emanating from 220/132 kV Biharsharif S/s tripped. Total power failure occurred at Biharsharif and supply to Ekangarsarai, Rajgir, Baripahari, Hatidah, Harnaut, Barh, Nalanda interrupted.
64.	JUSNL	03/02/2022	07:37	92	0	GD-I	220 kV Dumka-Godda D/c and 220 kV Dumka-Jasidih D/c tripped on O/V, leading to total power failure at Godda, Jasidih. Inclement weather reported during the event.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
65.	JUSNL	04/02/2022	02:30	22	0	GD-I	220 kV Dumka-Godda-2 tripped on O/V, leading to total power failure at Jasidih. Inclement weather reported during the event.
66.	JUSNL	04/02/2022	05:53	10	0	GD-I	All emanating lines from 220 kV Tenughat (TVNL) tripped. Two running units at Tenughat also tripped. This resulted in 300 MW generation loss at Tenughat power plant.
67.	Rongnichu HEP	09/02/2022	17:48	0	0	GD-I	At 17:48 Hrs during testing of relays at Rongnichu, 220 kV Rangpo-Rongnichu D/c tripped from Rongnichu end only. Consequently, Rongnichu S/s became dead.
68.	TUL	25/02/2022	13:27	0	0	GD-I	400 kV Teesta 3-Rangpo-1 and 400 kV Teesta 3-Dikchu tripped due to R_B_N fault. No generation or load loss occurred as all hydro units at Teesta 3 was out of bar.
69.	OPTCL	27/02/2022	11:17	40	90	GD-I	R_ph wave trap of 220 kV Jaynagar-Lakshmipur-1 burnt at Jaynagar end. Total power failure occurred at 220/132 kV Jaynagar, 220 kV Balimela, Upper Kolab S/s. 220 kV Bus-1 at Jeypore (PG) along with 400/220 kV ICT-1 & 3 also tripped. Two running units at Upper Kolab and one unit at Balimela tripped leading to 90 MW generation loss (Upper Kolab-40 MW, Balimela-50 MW)
70.	TVNL	07/03/2022	05:32	0	360	GD-I	All emanating lines from Tenughat tripped. Both running units at Tenughat also tripped and generation loss of 350 MW occurred.
71.	Tashiding HEP	11/03/2022	23:33	0	44	GD-I	At 23:33 Hrs, 220 kV Tashiding-Rangpo and 220 kV Tashiding-New Melli tripped from Tashiding end. Subsequently Tashiding S/s became dead due to loss of

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							evacuation path.
72.	DVC	18/03/2022	20:05	430	450	GD-I	At 20:05 Hrs, R_ph CT (HV side) of 220/3.3 kV 16 MVA Reserve Transformer#4 at CTPS A burst. All 220 kV Lines emanating from CTPS A tripped. Two running units at CTPS B also tripped.
73.	OPTCL	27/03/2022	12:47	562	1900	GD-I	At 12:47 Hrs, all lines emanating from 400/220/132 kV Lapanga S/s tripped from remote ends. As intimated, fault occurred due to heavy bush fire near the abandoned area of the grid. 1900 MW captive load at Vedanta (Sterlite) tripped due to delayed clearance of the fault. OPGC U#3 also tripped at the same time.
74.	JUSNL	30/03/2022	18:22	10	0	GD-I	At 18:22 Hrs, 220 kV Daltonganj-Garwah D/c tripped leading to total supply failure at Garhwa S/s.

ANNEXURE-XIV

GRID INCIDENTS

Grid incidents which occurred during the year 2021-22 are as follows:

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
1.	ISTS	21/04/2020	18:29	0	749	GI-2	At 18:26 hrs. successful auto-reclose of 400 kV JITPL – Angul – 2 occurred at JITPL end for transient R phase to earth fault. At 18:29 hrs. both running units at JITPL tripped because of operation of bus bar protection of bus 2 at JITPL due to CT failure.
2.	JUSNL	28/04/2020	06:29	50	300	GI-2	At 06:29 hrs, all feeders connected to Bus 2 i.e. Tenughat Unit #2, 220 kV TTPS – Patratu (PTPS) S/C, Station Transformer 2 at TTPS and 220 KV Bus coupler beaker at TTPS tripped due to operation LBB operation at TTPS.
3.	ISTS	07/05/2020	18:47	0	0	GI-2	At 18:47 Hrs, 400 KV Alipuduar - Jigmelling D/C tripped on R-Y-N fault caused tripping of Mangdechu units #1 and #2 (At Bhutan).
4.	JUSNL	18/05/2020	00:53	0	302	GI-1	220 kV TTPS – PTPS S/C tripped from PTPS end on B phase to earth fault. 220 kV TTPS – PTPS S/C, unit 2 at TTPS and station transformer 2 at TTPS were connected to 220 kV bus 2 at TTPS. So, both the running units at TTPS and 220 kV bus coupler at TTPS tripped to clear the fault.
5.	JUSNL	19/05/2020	02:56	200	0	GI-1	Fault occurred due to bursting of 132 kV side B phase CT of 220/132 kV ICT – 3 at 220/132 kV Hatia S/s. At same time, 220 kV Ranchi-Hatia 1 and 3, 220/132KV 150MVA ICT-1, 2 and 3 at Hatia tripped resulting total loss of supply at 132 kV voltage level of Hatia S/S. 220 kV bus at Hatia remained in service along with 220 kV PTPS – Hatia D/C and 220 kV Ranchi – Hatia – 2.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
6.	ISTS	24/05/2020	19:51	0	0	GI-1	220 kV Muzaffarpur Dhalkebar D/C tripped due to B phase directional O/C resulting in loss of power supply to Dhalkebar.
7.	ISTS	19/06/2020	12:54	0	109	GI-2	At 12:54 hrs. gas density high alarm initiated in 400 KV Rangpo-Binaguri Ckt-I and tripping command was sent to 400kV Main Bus-I at Rangpo. All feeders connected to 400 kV main bus 1 tripped. Due to unavailability of tie bay of 400/132 kV ICT at Dikchu, both the running units at Dikchu HEP were connected to bus 1 at Dikchu via 400/132 kV ICT.
8.	ISTS	24/06/2020	18:23	0	0	GI-1	220 kV Muzaffarpur Dhalkebar D/C tripped at 18:23 hrs from Muzaffarpur end on R phase directional earth fault. There was no generation or load loss reported in Indian grid at the time of the event.
9.	ISTS	25/06/2020	02:47	0	0	GI-2	400 kV Alipurduar -Jigmelling D/C tripped at 02:47 Hrs due to R phase to earth fault. At Alipurduar, auto reclose was successful for both circuits. But both the circuits tripped from Jigmelling end. Around 590 MW generation loss was reported at the time of the event. There was no generation or load loss reported in Indian grid at the time of the event.
10.	ISTS	26/06/2020	15:40	0	0	GI-2	400 kV Jigmelling - Alipurduar – 1 along with all four running units (generating around 770 MW) of Mangdechu tripped at 15:40 hrs. DT signal was received at Alipurduar end of 400 kV Jigmelling Alipurduar – 1 at the time of the tripping. Later, at 15:53 hrs, 400 kV Jigmelling - Alipurduar – 2 also tripped due to B phase to earth fault. There was no generation or load loss reported in Indian grid at the time of the event.
11.	ISTS	27/06/2020	14:48	0	161	GI-2	At 14:48 hrs 400 kV Rangpo – Kishangunj S/C tripped due to B phase to earth fault. At same time, unit 1 and 2 at Dikchu HEP and unit 2 at Jorethang tripped due to operation of differential relay.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
12.	WBSETCL	10/07/2020	08:45	61	0	GI-2	400 kV Arambag – New Chanditala S/C, 400 kV Arambag – Bakreswar S/C, 400 kV Arambag Kolaghat S/C and 400/220 kV ICT – 1, 2, 3 and 4 at Arambag tripped. At same time, all 220 KV lines connected to Arambag s/s and some 132 kV lines also tripped during this event. Flash over was reported at B phase pole of 220 kV side breaker of 315 MVA 400/220 kV ICT – 4 at Arambag.
13.	ISTS	16/07/2020	01:58	0	419	GI-2	At 01:58hrs. both poles of Talcher-Kolar HVDC tripped due to un-availability of 400kV bus voltage at Kolar end. Before tripping the power flow was 500MW. SPS acted and generation reduction happened at JITPL (150MW) and GMR (269MW). No generaton reduction in Talcher Stg-2.
14.	ISTS	22/07/2020	01:32	0	0	GI-2	At 01:32 hrs 400 kV Alipurduar Jigmelling D/C tripped due to R & B phase fault. Prior to the tripping, schedule to Mangdechu generating units were 762 MW. There was no load or generation loss reported in Indian grid at the time of the event.
15.	BSPTCL	14/08/2020	20:23	332	0	GI-1	At 20:23 hrs 220 kV Tenughat Bihar Sharif S/C tripped due to Y phase to earth fault. At same time, 400/220 kV ICT 2 and 3 at Bihar Sharif, 220/132 kV ICT 1, 2 and 3 at Bihar Sharif, 132 KV Bihar sharif –Sheikhupura S/C also tripped. During line patrolling, it was found that Y phase Conductor of 220 kV Bihar sharif – TTPS S/C snapped at location No. 496-497 and fell on 132 kV Bihar sharif – Sheikhupura D/C at tower loc no. 10 from Bihar Sharif.
16.	ISTS	31/08/2020	22:33	0	520	GI-1	At 22:27 HRs 400 KV Jigmeling-Mangdechu-2 tripped on B phase to earth fault. At 22:33 hrs while taking charging attempt of 400 KV Jigmeling-Mangdechu-2 ,400 KV Alipurduar-Jigmeling D/C tripped on zone-2 in Y to B phase short circuit fault. At the same time all the

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							running units of Mangdechu and 400 KV Mangdechu-Jigmeling-1 tripped.
17.	ISTS	07/11/2020	11:04	0	240	GI-2	On 07-11-2020, 400 kV Alipurduar Jigmelling D/C tripped on R and Y phase fault resulting tripping of both running units at Mangdechu due to loss of evacuation path. Fault location was around 200 km from Alipurduar.

Annexure-XV

Transmission Charges paid by various ER Constituents during the year 2021-22		
SI.	**Constituents**	**Charges (Rs. Cr.)**
1	BIHAR	1842
2	JHARKHAND	335
3	DVC	124
4	ODISHA	727
5	WEST BENGAL	933
6	SIKKIM	38
7	POWERGRID(PASAULI)	0
8	NVVN (BPDB)	231
9	TATA STEEL	73
10	RAILWAYS_JHARKHAND	27
11	RAILWAYS_BIHAR	31
12	RAILWAYS_DVC	33
13	RAILWAYS_ODISHA	0
14	RAILWAYS_WEST BENGAL	13
15	HVDC ALIPURDUAR	1
16	BRBCL NABINAGAR	6
17	NPGC NABINAGAR	17
18	NTPC DARLIPALLI	5
	Total	4437

ANNEXURE-XVI (A)

LTA Energy Transactions (MUs) in F.Y 2021-22

TRADERS	IMPORT to ER (MUs)
AGEMPL	0.000
AlfanarWind_SECI-III	132.812
AWEK1L	132.442
DADRI_SOLAR	7.193
FARIDABAD_SOLAR	6.841
GIWEL_SECI-III_RE	250.431
GIWEL_SECI-II_RE	741.553
HARYANA	6.841
IWISL	244.050
NVVNL	2742.005
OKWPL_RE	462.405
PTC	4213.937
PTC	116.773
RAJ_SOLAR	269.465
RWE_AP2_SECI-III	120.364
SECI_Trader	706.266
SECI_Trader	135.969
SEILP2	1902.036
SEIL_PROJECT2	0.000
Tuticorin_BETAMWIND	548.603
Tuticorin_GIREL	285.136
Tuticorin_Mytrah	327.521
Tuticorin_Orange	234.140
UNCHAHAR_SOLAR	13.508
Total	**13600.292**

TRADERS	EXPORT to ER (MUs)
APNRL	786.714
BESCOM	2381.036
BYPL	645.225
CHUZACHEN	433.815
CSEB_Beneficiary	15.943
CTPS 7&8	0.000
DELHI	5264.010
DSTPS I&II	1263.137
DSTPS I&II	1767.840
DVC	9129.256
DVC	4775.614
HARYANA	6.841
HIRAKUD HEP	15.943
JITPL	1592.174
KSEB	3578.258
MPL	5120.950
PTC	4213.937
PTC	108.765
PUNJAB	4134.509
TPDDL	2047.038
Total	**47281.005**

MTOA Energy Transactions (MUs) in F.Y 2021-22

TRADERS	IMPORT to ER (MUs)
PTC	913.817
PTC	869.018
SECI_Trader	352.117
Total	**2134.952**

TRADERS	EXPORT to ER (MUs)
JITPL	147.515
Total	**147.515**

ANNEXURE-XVI (B)

STOA Energy Transactions (MUs) in F.Y 2021-22

TRADERS	EXPORT to ER (MUs)
AMNSIL	29.220
APPCPL	1145.413
APPCPL_Trader	0.000
CHUZACHEN	0.000
GMRETL	225.876
IEXL	4824.499
IEXL_Trader	0.000
JITPL	0.000
JLHEP	7.274
KEIPL	1410.267
MPPMCL	1588.769
PXIL	3073.452
REFEX	0.000
TATASTEEL	6.216
TATASTL_BSL	75.408
THEP	6.128
TPTCL	3970.953
Total	**16363.476**

TRADERS	IMPORT to ER (MUs)
PTC	2868.250078
SECI_Trader	0
Total	**2868.250078**

Month-wise statement of Over/Under generation of ISGS & Over/Under drawl of Costituents during the year 2021-22

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
Apr-21	APNRL	347926.25	350017.0119	2090.76188	0.6
	NVVN-BD	-573727.0318	-573065.445	661.586823	-0.12
	BARH	790024.8587	784095.9559	-5928.902851	-0.75
	BARH SG1_INFIRM	0	-2719.551278	-2719.551278	0
	BSPHCL	-2928343.725	-2994510.121	-66166.39614	2.26
	BRBCL	470539.1731	469952.5742	-586.59888	-0.12
	CHUKHA	5007.21	34763.51179	29756.30179	594.27
	CHUZACHEN	16565.61	17062.2432	496.6332	3
	DARLIPALI	421835.005	422887.7502	1052.745191	0.25
	DARLIPALI_U2_INFIRM	0	14119.95893	14119.95893	0
	DIKCHU	23631.725	23251.9997	-379.725304	-1.61
	DVC	1447646.521	1435038.276	-12608.2454	-0.87
	NR	-1857560.265	-1205200.778	652359.4871	-35.12
	NER	-327330.5959	-34277.87322	293052.7226	-89.53
	SR	-1725178.67	-2164203.175	-439024.5042	25.45
	WR	1642589.929	1283331.044	-359258.8849	-21.87
	FSTPP - I & II	616280.4438	610293.7162	-5986.727543	-0.97
	FSTPP-III	308907.1748	303036.7378	-5870.436962	-1.9
	GMRKEL	403006.4625	406277.3021	3270.839612	0.81
	HVDC ALIPURDUAR	-419.444761	-392.763	26.681761	-6.36
	HVDC SASARAM	-724.893582	-608.316284	116.577298	-16.08
	JUVNL	-698200.6957	-705470.636	-7269.940347	1.04
	JITPL	695141.8025	692799.6993	-2342.103221	-0.34
	JORETHANG HEP	14125.3975	11408.352	-2717.0455	-19.24
	KHSTPP-I	534924.7351	523157.4809	-11767.2542	-2.2
	KHSTPP-II	998478.3945	995923.7477	-2554.646793	-0.26
	KURICHU	13432.25	-2947.7592	-16380.0092	-121.95
	MANGDECHU	91611.525	91053.52494	-558.000061	-0.61
	MPL	678133.8	678096.898	-36.902026	-0.01
	MTPS-II	228675.2004	225834.572	-2840.628433	-1.24
	NVVN-NEPAL	-194351.5523	-239185.5221	-44833.96973	23.07
	NPGC	400468.1786	399821.6394	-646.539212	-0.16
	NPGC-INFIRM	0	-4864.01223	-4864.01223	0
	GRIDCO	-1275500.368	-1284054.614	-8554.246483	0.67
	RANGIT	14606.5	14794.5336	188.0336	1.29
	SIKKIM	-44902.63485	-44547.17098	355.46387	-0.79
	TALCHER SOLAR	1224.1075	1254.69435	30.58685	2.5
	TALA	65520.9425	16855.75376	-48665.18874	-74.27
	TUL	276595.1025	270017.2315	-6577.871044	-2.38
	TEESTA	144667.25	150811.524	6144.273964	4.25
	THEP	13125.1575	11711.488	-1413.6695	-10.77
	TPTCL	16800	10425.79507	-6374.204928	-37.94
	TSTPP	446176.0911	442391.5492	-3784.541885	-0.85
	VAE_ER	-6504.5325	0	6504.5325	-100
	WBSETCL	-1257277.079	-1262129.63	-4852.550342	0.39
	RONGNICHU HEP INFIRM	0	54.752	54.752	0
	Total	**237645.308**	**172363.9497**	**-65281.35828**	-

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
May-21	APNRL	264823.3875	264002.758	-820.6295	-0.31
	NVVN-BD	-624124.6831	-628244.0629	-4119.379843	0.66
	BARH	521034.6919	516259.3356	-4775.356304	-0.92
	BARH SG1_INFIRM	0	-4634.1648	-4634.1648	0
	BSPHCL	-2759680.966	-2795053.761	-35372.79493	1.28
	BRBCL	395210.437	394985.9567	-224.480304	-0.06
	CHUKHA	66101.25	131951.6506	65850.40057	99.62
	CHUZACHEN	39108.935	39925.5552	816.6202	2.09
	DARLIPALI	417635.2429	413947.0678	-3688.175117	-0.88
	DARLIPALI_U2_INFIRM	0	-4418.921456	-4418.921456	0
	DIKCHU	55260.77	56932.72655	1671.956548	3.03
	DVC	1377724.603	1374217.898	-3506.704433	-0.25
	NR	-2460074.666	-2235232.947	224841.7198	-9.14
	NER	-123854.3179	65098.48385	188952.8017	-152.56
	SR	-707074.5766	-1888477.637	-1181403.06	167.08
	WR	-104657.3036	768978.7356	873636.0392	-834.76
	FSTPP - I & II	690417.1697	689015.3157	-1401.854006	-0.2
	FSTPP-III	245562.6751	248187.7176	2625.042467	1.07
	GMRKEL	375212.6575	376972.6479	1759.990382	0.47
	HVDC ALIPURDUAR	-436.921238	-522.9	-85.978762	19.68
	HVDC SASARAM	-629.748093	-643.613828	-13.865735	2.2
	JUVNL	-674729.8457	-662720.961	12008.88472	-1.78
	JITPL	662368.8325	662144.645	-224.187539	-0.03
	JORETHANG HEP	25944.085	23129.76	-2814.325	-10.85
	KHSTPP-I	488762.7836	481142.6984	-7620.08515	-1.56
	KHSTPP-II	942034.8091	935011.5581	-7023.250958	-0.75
	KURICHU	12992.5	20666.4264	7673.9264	59.06
	MANGDECHU	243821.5	245491.341	1669.841039	0.68
	MPL	631654.215	632631.2605	977.045503	0.15
	MTPS-II	175772.5494	180255.996	4483.446632	2.55
	NVVN-NEPAL	-154917.9551	-158264.8684	-3346.91329	2.16
	NPGC	371937.5378	372333.3967	395.858918	0.11
	NPGC-INFIRM	0	-5513.042	-5513.042	0
	GRIDCO	-994913.7384	-992274.2507	2639.487748	-0.27
	RANGIT	24915.75	25137.27	221.52	0.89
	RONGNICHU HEP INFIRM	0	-53.952	-53.952	0
	SIKKIM	-41248.54996	-44892.51353	-3643.963563	8.83
	TALCHER SOLAR	1226.5775	1270.44255	43.86505	3.58
	TALA	252238.25	174763.5717	-77474.6783	-30.71
	TUL	570244.725	565249.6645	-4995.060506	-0.88
	TEESTA	274773	282020.6491	7247.649056	2.64
	THEP	22562.355	20548.59186	-2013.763139	-8.93
	TPTCL	29952.015	19755.57461	-10196.44039	-34.04
	TSTPP	592736.5679	589598.0354	-3138.532567	-0.53
	VAE_ER	-98342.805	0	98342.805	-100
	WBSETCL	-970365.029	-967130.9263	3234.102703	-0.33
	Total	**56978.76623**	**183548.2101**	**126569.4439**	-

Month-wise statement of Over/Under generation of ISGS & Over/Under drawl of Costituents during the year 2021-22

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
Jun-21	APNRL	252741.305	251307.9218	-1433.383159	-0.57
	NVVN-BD	-636935.177	-638806.9717	-1871.794672	0.29
	BARH	654682.6705	649898.6543	-4577.381351	-0.7
	BARH SG1_INFIRM	0	-1832.302835	-1832.302835	0
	BSPHCL	-2980688.305	-2980199.306	488.999751	-0.02
	BRBCL	399956.122	394789.4477	-5166.674263	-1.29
	CHUKHA	158854.2725	259974.0845	101119.812	63.66
	CHUZACHEN	73430.39	73600.4256	170.0356	0.23
	DARLIPALI	483817.9867	477961.7924	-5856.194314	-1.21
	DARLIPALI_U2_INFIRM	0	35813.59947	35813.59947	0
	DIKCHU	72905.75	73566.18105	660.431049	0.91
	DVC	1251013.997	1248078.216	-2935.781774	-0.23
	NR	-2546381.318	-3021903.579	-475522.2616	18.67
	NER	81424.63607	-309369.3175	-390793.9536	-479.95
	SR	-744935.5275	-1461037.373	-716101.8453	96.13
	WR	-722967.577	951566.0592	1674533.636	-231.62
	FSTPP - I & II	725688.3068	717898.9642	-7789.342604	-1.07
	FSTPP-III	250653.2919	251106.3585	453.066585	0.18
	GMRKEL	342344.0475	344962.4664	2618.41893	0.76
	HVDC ALIPURDUAR	-708.940236	-704.058	4.882236	-0.69
	HVDC SASARAM	-472.144881	-624.014267	-151.869386	32.17
	JUVNL	-705943.7823	-700787.9216	5155.860653	-0.73
	JITPL	690232.8225	690702.463	469.640467	0.07
	JORETHANG HEP	56638.44527	51998.912	-4639.533268	-8.19
	KHSTPP-I	377810.8568	370636.5866	-7174.270188	-1.9
	KHSTPP-II	896456.6173	886978.3628	-9218.372634	-1.03
	KURICHU	35792.82	46898.2548	11105.4348	31.03
	MANGDECHU	399407.125	400257.011	849.885962	0.21
	MPL	602584.8075	600339.2247	-1146.914852	-0.19
	MTPS-II	191194.1671	194065.812	2871.644863	1.5
	NVVN-NEPAL	-106011.0005	-120151.8505	-14140.85001	13.34
	NPGC	402486.3892	401028.7252	-1457.664012	-0.36
	NPGC-INFIRM	0	1573.774208	1573.774208	0
	GRIDCO	-1083485.845	-1093150.115	-9664.270735	0.89
	RANGIT	36205	36004.0992	-200.9008	-0.55
	RONGNICHU HEP INFIRM	0	6970.72	6970.72	0
	SIKKIM	-35610.43134	-42316.54781	-6706.116471	18.83
	TALCHER SOLAR	975.4	993.7455	18.3455	1.88
	TALA	568182.535	414167.8754	-154014.6596	-27.11
	TUL	912430.4193	904350.5627	-8079.856593	-0.89
	TEESTA	255577.25	257856.795	2367.109817	0.93
	THEP	49095.52545	45322.544	-3772.981449	-7.68
	TPTCL	60421.975	51653.88782	-8768.087176	-14.51
	TSTPP	602764.8051	598853.1705	-3911.634678	-0.65
	VAE_ER	-30733.1725	0	30733.1725	-100
	WBSETCL	-1107081.51	-1133356.141	-26274.63048	2.37
	Total	**183815.0056**	**186937.1991**	**4774.94276**	-

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
Jul-21	APNRL	288253.0525	287357.376	-895.676544	-0.31
	NVVN-BD	-582573.3596	-581578.3896	994.969971	-0.17
	BARH	631775.2286	632054.8949	-6926.86728	-1.1
	BARH SG1_INFIRM	0	4830.838312	4830.838312	0
	BSPHCL	-3554176.729	-3571675.28	-17498.55115	0.49
	BRBCL	312802.2735	308231.7031	-4570.570384	-1.46
	CHUKHA	198075.35	222879.0321	24803.68211	12.52
	CHUZACHEN	88025.91	88096.5864	70.6764	0.08
	DARLIPALI	546572.6029	545449.2852	-1123.317629	-0.21
	DARLIPALI_U2_INFIRM	0	144867.6609	144867.6609	0
	DIKCHU	75712.21	76769.92652	1057.716517	1.4
	DVC	1286436.29	1300735.23	14298.94022	1.11
	NR	-3170515.06	-3183939.406	-13424.34616	0.42
	NER	172091.4007	-371342.9475	-543434.3482	-315.78
	SR	395824.7676	-878030.0409	-1273854.808	-321.82
	WR	-616659.3278	1110335.916	1726995.244	-280.06
	FSTPP - I & II	644545.3111	640548.6525	-3996.658586	-0.62
	FSTPP-III	235551.5352	231807.4733	-3744.061831	-1.59
	GMRKEL	351452.515	354918.3934	3465.878443	0.99
	HVDC ALIPURDUAR	-808.960366	-790.0632	18.897166	-2.34
	HVDC SASARAM	-438.869883	-661.235317	-222.365434	50.67
	JUVNL	-759610.5869	-754585.4724	5025.114533	-0.66
	JITPL	684514.9975	684186.2448	-328.752716	-0.05
	JORETHANG HEP	73816.93836	72112.224	-1704.714358	-2.31
	KHSTPP-I	340756.7762	332318.9698	-8437.806413	-2.48
	KHSTPP-II	897312.1648	885881.1406	-6881.765291	-0.77
	KURICHU	47141	52235.1036	5094.1036	10.81
	MANGDECHU	463604.88	464422.3182	817.438192	0.18
	MPL	646974.1	642115.1887	-2992.289096	-0.46
	MTPS-II	174382.5355	174433.244	50.708532	0.03
	NVVN-NEPAL	-70079.08734	-82425.37831	-12346.29097	17.62
	NPGC	431332.07	424985.5765	-6346.493515	-1.47
	NPGC-INFIRM	0	174146.1571	174146.1571	0
	GRIDCO	-1207137.757	-1220804.337	-13666.57992	1.13
	RANGIT	41808	41477.2056	-330.7944	-0.79
	RONGNICHU HEP INFIRM	0	1127.241	1127.241	0
	SIKKIM	-43285.85963	-44991.20888	-1705.349247	3.94
	TALCHER SOLAR	988.57915	941.8587	-46.72045	-4.73
	TALA	565931.35	457501.4265	-108429.9235	-19.16
	TUL	941864.9175	937512.2422	-4352.675281	-0.46
	TEESTA	357629.5	360952.03	3223.9738	0.9
	THEP	75636.95804	74857.472	-779.486037	-1.03
	TPTCL	91869.12	85103.78369	-6765.336312	-7.36
	TSTPP	588675.9397	584713.9042	-3962.035519	-0.67
	VAE_ER	-67525.845	0	67525.845	-100
	WBSETCL	-1523651.787	-1565183.164	-41531.37778	2.73
	RONGNICHU HEP	66120.72	63717.143	-2403.577	-3.64
	Total	**121015.7647**	**207616.52**	**85711.54653**	-

Month-wise statement of Over/Under generation of ISGS & Over/Under drawl of Costituents during the year 2021-22

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
Aug-21	APNRL	216451.615	215531.2684	-920.346562	-0.43
	NVVN-BD	-507242.5325	-506196.0639	1046.468577	-0.21
	BARH	751157.1114	743994.1297	-6858.844015	-0.91
	BARH SG1_INFIRM	0	82895.74856	82895.74856	0
	BSPHCL	-3441508.285	-3449766.981	-8258.695613	0.24
	BRBCL	358548.0112	354099.1066	-4448.90459	-1.24
	CHUKHA	190813.75	254744.0171	63930.26713	33.5
	CHUZACHEN	86800.5	87480.6912	680.1912	0.78
	DARLIPALI	549736.2575	549630.6681	-105.589444	-0.02
	DARLIPALI_U2_INFIRM	0	38573.3828	38573.3828	0
	DIKCHU	77485.8	77859.45373	373.65373	0.48
	DVC	1008951.022	967618.6506	-41332.37184	-4.1
	NR	-2859654.802	-2731343.256	128311.5466	-4.49
	NER	200013.9634	-155332.2191	-355346.1825	-177.66
	SR	-54572.74122	-1333665.342	-1279092.601	2343.83
	WR	-997451.663	539615.4168	1537067.08	-154.1
	FSTPP - I & II	519976.03	514002.4045	-5973.625511	-1.15
	FSTPP-III	225882.257	222140.4182	-3741.838815	-1.66
	GMRKEL	359283.935	366309.7397	7025.804727	1.96
	HVDC ALIPURDUAR	-830.425788	-785.8284	44.597388	-5.37
	HVDC SASARAM	-546.948079	-651.391776	-104.443697	19.1
	JUVNL	-723393.7755	-734148.798	-10755.02245	1.49
	JITPL	736044.01	733720.4996	-2323.510367	-0.32
	JORETHANG HEP	74692.77601	70639.04	-4053.736013	-5.43
	KHSTPP-I	464590.2272	454914.0319	-9676.195278	-2.08
	KHSTPP-II	727623.578	708667.9684	-4133.423491	-0.57
	KURICHU	45875	48290.4756	2415.4756	5.27
	MANGDECHU	504230.25	510338.1372	6107.887205	1.21
	MPL	683503.29	670668.4255	1734.651074	0.25
	MTPS-II	138342.0214	137270.832	-1071.189438	-0.77
	NVVN-NEPAL	-3366.9685	13805.09058	17172.05908	-510.02
	NPGC	689950.1414	686223.6172	-3726.524211	-0.54
	NPGC-INFIRM	0	-386.21	-386.21	0
	GRIDCO	-976224.6072	-982199.4474	-5974.840162	0.61
	RANGIT	40784.5	40661.9544	-122.5456	-0.3
	RONGNICHU HEP	74390.5	73997.76	-392.74	-0.53
	SIKKIM	-42730.88496	-44169.13695	-1438.251989	3.37
	TALCHER SOLAR	1129.245	1023.618	-105.627	-9.35
	TALA	670196	522483.2713	-147712.7287	-22.04
	TUL	944072.58	939824.134	-4248.445996	-0.45
	TEESTA	385959	387501.5577	1880.966262	0.49
	THEP	77554.12479	74622.24	-2931.884788	-3.78
	TPTCL	91869.12	78933.04003	-12936.07997	-14.08
	TSTPP	657989.8024	658106.4054	116.602946	0.02
	VAE_ER	-5216.39	0	5216.39	-100
	WBSETCL	-1676707.711	-1699141.007	-22433.29652	1.34
	BRBCL_U4_INFIRM	0	-26.094	-26.094	0
	Total	**264448.6841**	**188375.4194**	**-46039.01667**	-

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
Sep-21	APNRL	176410.5	174531.9982	-1878.50177	-1.06
	NVVN-BD	-522614.3441	-519078.7585	3535.585578	-0.68
	BARH	561740.0375	555196.7129	-7191.406675	-1.28
	BARH SG1_INFIRM	0	94495.06239	94495.06239	0
	BSPHCL	-3291864.692	-3311217.317	-19352.62446	0.59
	BRBCL	257573.5346	259794.9946	2221.460045	0.86
	BRBCL_U4_INFIRM	0	-1107.797148	-1107.797148	0
	CHUKHA	179863.35	229114.2177	49250.8677	27.38
	CHUZACHEN	73164.34	73926.2784	761.9384	1.04
	DARLIPALI	979212.6855	977594.0628	-1618.622776	-0.17
	DARLIPALI_U2_INFIRM	0	0	0	0
	DIKCHU	67269.12	66750.81751	-518.30249	-0.77
	DVC	1184029.472	1177294.531	-6734.940507	-0.57
	NR	-2278376.244	-2299038.643	-20662.39954	0.91
	NER	147031.9106	-316591.5288	-463623.4394	-315.32
	SR	-136930.6343	-1150733.337	-1013802.702	740.38
	WR	-1735124.304	-150320.2578	1584804.046	-91.34
	FSTPP - I & II	485304.202	483377.293	-1926.909077	-0.4
	FSTPP-III	254118.6021	247650.4452	-6468.156926	-2.55
	GMRKEL	422981.5475	427334.2503	4352.702803	1.03
	HVDC ALIPURDUAR	-684.531915	-792.3876	-107.855685	15.76
	HVDC SASARAM	-606.830977	-622.54229	-15.711313	2.59
	JUVNL	-693858.2378	-684435.0674	9423.170416	-1.36
	JITPL	679366.25	677314.9022	-2051.347814	-0.3
	JORETHANG HEP	72153.86001	67028.848	-5125.012012	-7.1
	KHSTPP-I	468250.1417	458940.0611	-9310.080614	-1.99
	KHSTPP-II	591508.1225	575251.1941	-1382.105673	-0.23
	KURICHU	43282.5	48585.8772	5303.3772	12.25
	MANGDECHU	496507.05	502413.1586	5906.10864	1.19
	MPL	650799.54	626167.7392	2669.63306	0.41
	MTPS-II	114613.5755	112403.16	-2210.415542	-1.93
	NVVN-NEPAL	0	24557.81791	24557.81791	0
	NPGC	661453.1033	659483.1843	-1969.919	-0.3
	NPGC-INFIRM	0	-1843.7	-1843.7	0
	GRIDCO	-1051097.099	-1053472.419	-2375.319657	0.23
	RANGIT	41452.5	41611.5804	159.0804	0.38
	RONGNICHU HEP	64626.75	63898.528	-728.222	-1.13
	SIKKIM	-30112.28393	-44412.80875	-14300.52482	47.49
	TALCHER SOLAR	931.59	887.2251	-44.3649	-4.76
	TALA	605178.05	479888.4674	-125289.5826	-20.7
	TUL	880881.69	874749.3003	-6132.389656	-0.7
	TEESTA	366643.5	371357.9237	5065.683897	1.38
	THEP	72769.75791	69331.936	-3437.821907	-4.72
	TPTCL	88342.08	73784.4991	-14557.5809	-16.48
	TSTPP	597599.1969	593589.2761	-4009.920853	-0.67
	VAE_ER	-69051.03	0	69051.03	-100
	WBSETCL	-1351406.537	-1379083.887	-27677.34982	2.05
	Total	**123331.7902**	**175554.8917**	**94102.53624**	-

Month-wise statement of Over/Under generation of ISGS & Over/Under drawl of Costituents during the year 2021-22

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
Oct-21	APNRL	284120.8125	283788.1427	-332.669848	-0.12
	NVVN-BD	-535417.8187	-533519.7764	1898.042214	-0.35
	BARH	370700.0739	365655.0119	-3095.158372	-0.83
	BARH SG1_INFIRM	0	84343.11086	84343.11086	0
	BSPHCL	-2748920.471	-2796700.333	-47779.8627	1.74
	BRBCL	372373.2011	374200.0771	1826.876017	0.49
	BRBCL_U4_INFIRM	0	4312.500963	4312.500963	0
	CHUKHA	153093.48	258932.3457	105838.8657	69.13
	CHUZACHEN	54428.035	54742.9344	314.8994	0.58
	DARLIPALI	917066.4635	917559.366	492.902573	0.05
	DIKCHU	45483.5875	46482.18137	998.593871	2.2
	DVC	825280.7575	770845.9035	-54434.85405	-6.6
	NR	-1703235.247	-1977903.097	-274667.8491	16.13
	NER	76715.50614	-338862.7621	-415578.2682	-541.71
	SR	-750748.1012	-1570717.103	-819969.0019	109.22
	WR	-1437898.966	144910.8952	1582809.862	-110.08
	FSTPP - I & II	616979.9925	621082.5761	4102.583581	0.66
	FSTPP-III	145761.4438	142392.5072	-3368.936578	-2.31
	GMRKEL	411801.28	414519.6323	2718.352251	0.66
	HVDC ALIPURDUAR	-471.7315	-729.0948	-257.3633	54.56
	HVDC SASARAM	-592.911643	-618.741163	-25.82952	4.36
	JUVNL	-665224.4124	-678719.9896	-13495.57724	2.03
	JITPL	390138.3025	383350.6869	-6787.615595	-1.74
	JORETHANG HEP	63492.76788	56740.256	-6752.51188	-10.64
	KHSTPP-I	472032.483	466737.7154	-5294.76765	-1.12
	KHSTPP-II	647641.262	645484.8086	2729.186068	0.42
	KURICHU	44725.25	36933.4512	-7791.7988	-17.42
	MANGDECHU	310203.805	310983.9242	780.119195	0.25
	MPL	614842.1325	600194.9395	5019.775666	0.82
	MTPS-II	191530.8745	189198.548	-2332.326492	-1.22
	NVVN-NEPAL	-9.282963	37953.67234	37962.9553	-408953
	NPGC	714155.4079	710252.1816	-3843.780857	-0.54
	NPGC-INFIRM	0	-1633.425	-1633.425	0
	GRIDCO	-1149461.955	-1160336.447	-10874.492	0.95
	RANGIT	42818.5	42515.6796	-302.8204	-0.71
	RONGNICHU HEP	49409	49825.632	416.632	0.84
	SIKKIM	-44468.6883	-45095.06369	-626.375388	1.41
	TALCHER SOLAR	1162.545	1064.8521	-97.6929	-8.4
	TALA	532752.5	366765.0317	-165987.4683	-31.16
	TUL	623824.0025	611765.5212	-12058.48133	-1.93
	TEESTA	296076	302647.3061	5225.107567	1.76
	THEP	65801.31566	60391.344	-5409.971661	-8.22
	TPTCL	70548.12	58675.88496	-11872.23504	-16.83
	TSTPP	636350.6071	638178.7417	1828.134622	0.29
	VAE_ER	-16108.82	0	16108.82	-100
	WBSETCL	-772143.4637	-789238.1019	-17094.63822	2.21
	Total	**216607.6391**	**159353.4275**	**-32038.45289**	-

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
Nov-21	APNRL	280359.5875	279561.6699	-797.917572	-0.28
	NVVN-BD	-477198.0034	-476956.2133	241.790125	-0.05
	BARH-II	72017.60207	60360.93035	-11927.02112	-16.56
	BARH SG1_INFIRM	0	-744.861477	-744.861477	0
	BSPHCL	-1963379.815	-1946554.279	16825.53596	-0.86
	BRBCL	424970.018	429631.7031	4661.685133	1.1
	BRBCL_U4_INFIRM	0	37396.29228	37396.29228	0
	CHUKHA	43887.17	134212.7716	90325.60165	205.81
	CHUZACHEN	26888.43	27337.2	448.77	1.67
	DARLIPALI	959154.8881	963999.8736	4844.985484	0.51
	DIKCHU	21354.905	21697.72707	342.822072	1.61
	DVC	984417.2469	1010167.986	25750.73935	2.62
	NR	-1527786.922	-2457213.197	-929426.2745	60.83
	NER	157119.2206	-207683.7776	-364802.9982	-232.18
	SR	99222.98216	-1641325.821	-1740548.803	-1754.18
	WR	-3614731.26	-627179.0825	2987552.178	-82.65
	FSTPP - I & II	768589.4153	770182.3576	1592.94225	0.21
	FSTPP-III	256037.4897	254951.6322	-1085.857485	-0.42
	GMRKEL	409116.01	410742.7596	1626.749578	0.4
	HVDC ALIPURDUAR	-113.151482	-463.437	-350.285518	309.57
	HVDC SASARAM	-549.902115	-572.957632	-23.055517	4.19
	JUVNL	-665501.6242	-675022.7756	-9521.151378	1.43
	JITPL	611707.505	608226.6848	-3480.820242	-0.57
	JORETHANG HEP	36703.5	32450.592	-4252.908	-11.59
	KHSTPP-I	397152.5786	392500.5118	-4652.066765	-1.17
	KHSTPP-II	865160.996	860107.7849	-802.239929	-0.09
	KURICHU	43282.5	14356.9764	-28925.5236	-66.83
	MANGDECHU	138303.3	138569.5259	266.225853	0.19
	MPL	570791.29	567878.6489	4246.145255	0.74
	MTPS-II	205282.5498	204635.844	-646.705756	-0.32
	NVVN-NEPAL	26208	43090.76315	16882.76315	64.42
	NPGC	638225.9227	631492.054	-2552.67853	-0.4
	NPGC-INFIRM	0	-1671.1875	-1671.1875	0
	GRIDCO	-1310304.258	-1295367.643	14936.61473	-1.14
	RANGIT	27864.25	28029.5388	165.2888	0.59
	RONGNICHU HEP	23344.75	23842.336	497.586	2.13
	SIKKIM	-45609.60237	-49732.51552	-4122.913145	9.04
	TALCHER SOLAR	1010.995	976.5588	-34.4362	-3.41
	TALA	314630.62	177266.7839	-137363.8361	-43.66
	TUL	347968.0998	340730.1784	-7237.921405	-2.08
	TEESTA	181422.5	184824.7256	2815.582081	1.55
	THEP	37501.525	34206.528	-3294.997	-8.79
	TPTCL	43223.68	40303.31105	-2920.368952	-6.76
	TSTPP	602808.0146	602450.1387	-357.875944	-0.06
	VAE_ER	16570.835	0	-16570.835	-100
	WBSETCL	16969.13241	-8935.488524	-25904.62093	-152.66
	BARH-I	227080.1214	227036.4919	-43.629475	-0.02
	Total	**271173.0918**	**163795.6439**	**-92643.49298**	-

Month-wise statement of Over/Under generation of ISGS & Over/Under drawl of Costituents during the year 2021-22

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
	APNRL	328415.0725	326779.5604	-1635.512087	-0.5
	NVVN-BD	-398118.7566	-396728.2143	1390.542334	-0.35
	BARH-II	486294.8977	475648.0188	-9811.643228	-2.02
	BARH-I	314590.8303	307373.9007	-7216.929628	-2.29
	BSPHCL	-2040493.346	-2040902.952	-409.605774	0.02
	BRBCL	560985.2521	563707.7034	2722.451311	0.49
	BRBCL_U4_INFIRM	0	0	0	0
	CHUKHA	7401.8725	78236.50494	70834.63244	956.98
	CHUZACHEN	15035.005	15331.6416	296.6366	1.97
	DARLIPALI	410670.5246	407238.4928	-3432.031779	-0.84
	DIKCHU	10127	9700.181713	-426.818287	-4.21
	DVC	1231658.981	1265319.51	33660.52861	2.73
	NR	-1972626.52	-2934811.67	-962185.1499	48.78
	NER	56234.83258	-275756.8969	-331991.7295	-590.37
	SR	1481.265288	-1505808.008	-1507289.274	-101756.88
	WR	-3137320.78	-261736.9061	2875583.874	-91.66
	FSTPP - I & II	842549.9405	844793.8729	2243.932403	0.27
	FSTPP-III	280099.6659	277540.7704	-2558.895479	-0.91
	GMRKEL	344664.725	346787.1965	2122.47153	0.62
	HVDC ALIPURDUAR	-411.992378	-387.2676	24.724778	-6
	HVDC SASARAM	-520.279791	-358.067339	162.212452	-31.18
	JUVNL	-643096.8929	-658028.9973	-14932.10442	2.32
	JITPL	748489.835	747725.6653	-764.169686	-0.1
Dec-21	JORETHANG HEP	21738.2	18798.336	-2939.864	-13.52
	KHSTPP-I	385158.8577	384870.5849	-288.272809	-0.07
	KHSTPP-II	868389.183	858059.2777	-1159.286436	-0.13
	KURICHU	44725.25	3208.4136	-41516.8364	-92.83
	MANGDECHU	61331.75	61350.90846	19.158455	0.03
	MPL	595975.22	586951.2305	3685.556853	0.62
	MTPS-II	222856.9295	224521.324	1664.39454	0.75
	NVVN-NEPAL	-60563.37513	-65795.34489	-5231.969765	8.64
	NPGC	820746.6617	820288.296	6276.74699	0.76
	NPGC-INFIRM	0	-4118.995	-4118.995	0
	GRIDCO	-1236936.585	-1238684.307	-1747.721656	0.14
	RANGIT	19675.75	20357.898	682.148	3.47
	RONGNICHU HEP	12190.25	12558.88	368.63	3.02
	SIKKIM	-45377.99677	-60018.97762	-14640.98085	32.26
	TALCHER SOLAR	1043.6275	963.97095	-79.65655	-7.63
	TALA	141278.67	34751.98188	-106526.6881	-75.4
	TUL	235037.695	231946.1068	-3091.58824	-1.32
	TEESTA	89685	92540.9082	2856.790599	3.19
	THEP	23531.125	21208.96	-2322.165	-9.87
	TPTCL	28680	25732.66634	-2947.333656	-10.28
	TSTPP	277161.0463	276097.6597	-1063.386532	-0.38
	VAE_ER	-17244.05	0	17244.05	-100
	WBSETCL	290801.5435	287517.1289	-3284.414554	-1.13
	Bhutan_State	0	21934.22271	21934.22271	0
	Total	**225995.8839**	**206705.1695**	**10160.68167**	-

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
	APNRL	323297.3	323553.524	256.224018	0.08
	NVVN-BD	-480904.864	-478273.0136	2631.8504	-0.55
	BARH-II	710692.6173	716261.8815	4545.848579	0.64
	BARH-I	342942.7042	338062.0772	-4880.627054	-1.42
	Bhutan_State	4523.090575	-3535.600025	-8058.6906	-178.17
	BSPHCL	-2360526.442	-2347040.054	13486.38724	-0.57
	BRBCL	560289.5844	561877.958	1588.373629	0.28
	CHUKHA	2018.5	-71718.14188	-73736.64188	-3653.04
	CHUZACHEN	10641.985	10838.5056	196.5206	1.85
	DARLIPALI	868992.0977	866513.2578	-2478.83988	-0.29
	DIKCHU	8717.69	8773.545389	55.855389	0.64
	DVC	1318205.782	1348469.85	30264.06813	2.3
	NR	-1597403.172	-2526513.66	-929110.4878	58.16
	NER	-138272.741	42193.68628	180466.4273	-130.51
	SR	-478237.8361	-1760681.001	-1282443.165	268.16
	WR	-2346116.948	-373026.3921	1973090.556	-84.1
	FSTPP - I & II	834741.1641	833720.4592	-1020.704917	-0.12
	FSTPP-III	286388.9238	278643.4205	-7745.503225	-2.7
	GMRKEL	379647.89	381667.7053	2019.815286	0.53
	HVDC ALIPURDUAR	-554.633786	-347.8782	206.755586	-37.28
	HVDC SASARAM	-640.621134	-192.370325	448.250809	-69.97
	JUVNL	-688883.5202	-696097.0756	-7213.555388	1.05
	JITPL	665171.0625	662647.9207	-2523.141827	-0.38
Jan-22	JORETHANG HEP	15394.8	13466.336	-1928.464	-12.53
	KHSTPP-I	467771.9848	464532.668	-3239.316782	-0.69
	KHSTPP-II	879151.616	871880.3853	512.48708	0.06
	KURICHU	917.25	-4676.3964	-5593.6464	-609.83
	MANGDECHU	3368.25	22804.47249	19436.22249	577.04
	MPL	598899.7725	586843.9214	2336.191779	0.39
	MTPS-II	213899.7998	214752.456	852.656237	0.4
	NVVN-NEPAL	-151525.9071	-162219.3438	-10693.43672	7.06
	PTC_BHUTAN	-90868.11144	-93634.47668	-2766.365243	3.04
	NPGC	676495.2608	674420.5236	3222.741327	0.48
	NPGC-INFIRM	0	22619.97853	22619.97853	0
	GRIDCO	-1291823.249	-1285311.792	6511.457317	-0.5
	RANGIT	14554.5	15129.6672	575.1672	3.95
	RONGNICHU HEP	5553	5637.152	84.152	1.52
	SIKKIM	-58560.63572	-62326.42619	-3765.790469	6.43
	TALCHER SOLAR	1023.46	1024.24905	0.78905	0.08
	TALA	0	-40044.41089	-40044.41089	0
	TUL	177137.31	175522.3255	-1614.984502	-0.91
	TEESTA	57171	59187.34487	2090.953473	3.66
	THEP	17123.325	15437.632	-1685.693	-9.84
	TPTCL	24120	19405.25479	-4714.745208	-19.55
	TSTPP	426810.1451	428780.3902	1970.24504	0.46
	VAE_ER	-47261.79	0	47261.79	-100
	WBSETCL	15843.04136	18775.23971	2932.198351	18.51
	Total	**179924.4358**	**77805.75537**	**-75594.24809**	-

Month-wise statement of Over/Under generation of ISGS & Over/Under drawl of Costituents during the year 2021-22

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
	APNRL	305409.335	305938.6151	529.280149	0.17
	NVVN-BD	-477857.1307	-474793.8861	3063.244651	-0.64
	BARH-II	679638.9013	677539.9561	-3501.647958	-0.52
	BARH SG1_U2_INFIRM	0	-3099.4848	-3099.4848	0
	BARH-I	108539.6322	105829.7451	-2709.887122	-2.5
	BSPHCL	-2007487.988	-1995499.875	11988.113	-0.6
	BRBCL	485912.9244	484744.577	-1168.347339	-0.24
	CHUKHA	930.5	-59419.27786	-60349.77786	-6485.74
	CHUZACHEN	6352.34	6605.088	252.748	3.98
	DARLIPALI	703261.4386	700863.5191	-2397.919501	-0.34
	DIKCHU	7874.56	8042.636392	168.076392	2.13
	DVC	1176048.374	1196047.056	19998.68123	1.7
	NR	-1004174.209	-2358381.867	-1354207.658	134.86
	NER	-12368.36102	333049.1229	345417.484	-2792.75
	SR	-304752.0196	-1792926.305	-1488174.286	488.32
	WR	-3003612.788	-596435.6273	2407177.161	-80.14
	FSTPP - I & II	875398.3196	864125.1383	-3834.330367	-0.44
	FSTPP-III	163607.324	156062.4515	-7544.872501	-4.61
	GMRKEL	310990.79	314733.815	3743.025034	1.2
	HVDC ALIPURDUAR	-482.077027	-322.3332	159.743827	-33.14
	HVDC SASARAM	-581.589132	-171.455798	410.133334	-70.52
	JUVNL	-540656.9398	-542668.1863	-2011.246566	0.37
	JITPL	684286.1525	682864.066	-1422.086517	-0.21
Feb-22	JORETHANG HEP	12534.65	10498.752	-2035.898	-16.24
	KHSTPP-I	460181.3597	456364.1386	-3817.221119	-0.83
	KHSTPP-II	715170.2617	703945.8749	-434.715755	-0.06
	KURICHU	10	-8325.2844	-8335.2844	-83352.84
	MANGDECHU	7296.75	18819.49073	11522.74073	157.92
	MPL	502323.1075	484863.8315	626.291818	0.12
	MTPS-II	220835.0757	221448.376	613.300292	0.28
	NVVN-NEPAL	-172346.6328	-177660.7255	-5314.092681	3.08
	PTC_BHUTAN	-92739.20292	-90524.62715	2214.575764	-2.39
	NPGC	808370.7493	801602.47	2854.867969	0.35
	NPGC-INFIRM	0	34871.48529	34871.48529	0
	GRIDCO	-1271357.047	-1269499.872	1857.174872	-0.15
	RANGIT	8876	9343.1976	467.1976	5.26
	RONGNICHU HEP	0	53.856	53.856	0
	SIKKIM	-57230.57162	-58057.12062	-826.549	1.44
	TALCHER SOLAR	1160.565	1199.72745	39.16245	3.37
	TALA	0	-41599.55562	-41599.55562	0
	TUL	139867.665	138975.9981	-891.666918	-0.64
	TEESTA	53648	55360.98125	1740.74905	3.24
	THEP	12719.625	11513.76	-1205.865	-9.48
	TPTCL	19324.22	17362.99673	-1961.223272	-10.15
	TSTPP	611879.3765	614902.4921	3023.115635	0.49
	VAE_ER	-4681.6	0	4681.6	-100
	WBSETCL	111105.4237	104057.9105	-7047.513234	-6.34
	Total	**243225.2649**	**52245.64124**	**-146417.3215**	-

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	% of Deviation from Schedule
	APNRL	343543.1850000	343805.9602450	262.775245	0.08
	NVVN-BD	-566075.5489510	-563726.4671230	2349.081828	-0.41
	BARH-II	829205.9471390	813329.6738230	-14901.98052	-1.8
	BARH SG1_U2_INFIRM	0.0000000	-2203.8768000	-2203.8768	0
	BARH-I	291727.7367540	286223.3508020	-5504.385952	-1.89
	BSPHCL	-2853122.5614420	-2856127.3967660	-3004.835324	0.11
	BRBCL	610573.8814400	608429.2302610	-2144.651179	-0.35
	CHUKHA	41955.4800000	19035.8599630	-22919.62004	-54.63
	CHUZACHEN	12402.7850000	12846.2592000	443.4742	3.58
	DARLIPALI	1107790.6743800	1113068.6861180	5278.011738	0.48
	DIKCHU	14607.3150000	14657.9090020	50.594002	0.35
	DVC	1632807.1375060	1645136.6436410	12329.50614	0.76
	NR	-1266335.1335630	-2134929.3539190	-868594.2204	68.59
	NER	-46000.1258600	37888.7817180	83888.90758	-182.37
	SR	-871845.3175450	-2308312.6415250	-1436467.324	164.76
	WR	-2454080.5413780	-283578.9149390	2170501.626	-88.44
	FSTPP - I & II	923338.7115620	906908.1978290	-711.273033	-0.08
	FSTPP-III	300893.9437460	295618.2886330	-2860.615313	-0.95
	GMRKEL	400966.2550000	405109.0869020	4142.831902	1.03
	HVDC ALIPURDUAR	-515.2554220	-366.3576000	148.897822	-28.9
	HVDC SASARAM	-586.4291040	-219.0486900	367.380414	-62.65
	JUVNL	-685002.5805370	-709189.1330950	-24186.55256	3.53
	JITPL	789387.5375000	790538.8283100	1151.29081	0.15
Mar-22	JORETHANG HEP	16492.0500000	14356.5760000	-2135.474	-12.95
	KHSTPP-I	503692.9643600	500771.5171770	-2921.447183	-0.58
	KHSTPP-II	691163.6726250	677676.0999440	-588.274681	-0.09
	KURICHU	38.0000000	5358.9924000	5320.9924	14002.61
	MANGDECHU	85148.7400000	78486.8718910	-6661.868109	-7.82
	MPL	391037.0125000	381040.6324390	2045.299139	0.52
	MTPS-II	261463.5915500	261356.7400000	-106.85155	-0.04
	NVVN-NEPAL	-126862.8706930	-141905.6713200	-15042.80063	11.86
	PTC_BHUTAN	103835.1654200	115185.7720420	11350.60662	10.93
	NPGC	919357.8464660	917103.9020430	8840.922177	0.96
	NPGC-INFIRM	0.0000000	57751.8700490	57751.87005	0
	GRIDCO	-1373707.9474920	-1392840.8173750	-19132.86988	1.39
	RANGIT	14729.7500000	16000.8408000	1271.0908	8.63
	RONGNICHU HEP	0.0000000	-20.8960000	-20.896	0
	SIKKIM	-54272.5515800	-51883.9149960	2388.636584	-4.4
	TALCHER SOLAR	1273.1650000	1246.7854500	-26.37955	-2.07
	TALA	9584.6775000	12304.0477880	2719.370288	28.37
	TUL	268375.7575000	267314.7607150	-1060.996785	-0.4
	TEESTA	138104.5000000	142417.9258860	4237.480586	3.07
	THEP	13541.5500000	11995.6000000	-1545.95	-11.42
	TPTCL	21556.8600000	19398.6574320	-2158.202568	-10.01
	TSTPP	668153.8526310	670620.3885120	2466.535881	0.37
	WBSETCL	-701022.6740230	-708325.6585470	-7302.984524	1.04
	VAE_ER	-1746.5675000	0.0000000	1746.5675	-100
	Total	**405573.6404890**	**289354.5883200**	**-61150.58037**	-

Annexure-XVII-B

Actual Injection/Drawal (in MWH) during F.Y. 2021-22

Constituents	Total
APNRL	3406175.8067500
NVVN-BD	-6370967.2624390
BARH	6990295.1557840
BARH SG1_INFIRM	256633.8797400
BSPHCL	-33085247.6555650
BRBCL	5204445.0318550
CHUKHA	1492706.5762210
CHUZACHEN	507793.4088000
DARLIPALI	8356713.8218750
DARLIPALI_U2_INFIRM	228955.6805970
DIKCHU	484485.2859890
DVC	14738969.7507710
NR	-29066411.4531220
NER	-1530987.2479470
SR	-19455917.7843450
WR	2506460.8861980
FSTPP - I & II	8495948.9480190
FSTPP-III	2909138.2211180
GMRKEL	4550334.9954780
HVDC ALIPURDUAR	-6604.3686000
HVDC SASARAM	-5943.7547090
JUVNL	-8201875.0138770
JITPL	8016222.3057530
JORETHANG HEP	442627.9840000
KHSTPP-I	5286886.9646000
KHSTPP-II	9604868.2029750
KURICHU	260584.5312000
MANGDECHU	2844990.6845840
MPL	7057791.9406730
MTPS-II	2340176.9040000
NVVN-NEPAL	-1028201.3608410
NPGC	7499035.5665710
NPGC-INFIRM	270932.6934130
GRIDCO	-14267996.0615560
RANGIT	331063.4652000
RONGNICHU HEP INFIRM	8098.7610000
SIKKIM	-592443.4055170
TALCHER SOLAR	12847.7280000
TALA	2575104.2449060
TUL	6257958.0258170
TEESTA	2647479.6712520
THEP	451148.0958610
TPTCL	500535.3516240
TSTPP	6698282.1515540
VAE_ER	0.0000000
WBSETCL	-9102173.7257950
RONGNICHU HEP	293510.3910000
BRBCL_U4_INFIRM	40574.9020980
BARH-I	1264525.5656340
BARH SG1_U2_INFIRM	-5303.3616000
Bhutan_State	18398.6226830
PTC_BHUTAN	-68973.3317910
Total	2063656.4158890

Annexure -XVIII

STATUS OF REACTIVE ENERGY CHARGES ACCOUNT

RECEIVABLE IN/PAYABLE BY ER POOL AS PER PUBLISHED A/C FROM 05.04.2021 TO 27.03.2022 (2021 -22)

Constituents	Amount Recievable in the Pool (Rs.)	Amount Received in the Pool (Rs.)	Amount Payable by pool(Rs.)	Amount paid by pool(Rs.)	Total Outstanding (Rs.)
BSPHCL	118694701	71839832	38675458	31945318	40124729
JUVNL	113662286	83230845	782704	0	29648737
DVC	63224623	62090256	16006559	14872192	0
GRIDCO	217426697	217426697	18887136	18887136	0
SIKKIM	7708688	334815	2909208	545890	5010555
WBSETCL	68232488	63345409	5737146	5737146	4887079
TOTAL	588949483	498267854	82998211	71987682	79671100

Annexure-XIX

Compensation received by various generating stations of ER during the year 2021-22		
SL NO.	**Station**	**Compensation (Rs. Cr.)**
1	BARH-II	22.12
2	BARH-II	5.52
3	FSTPS-I&II	64.10
4	FSTPS-III	21.55
5	KhSTPS-I	0.00
6	KhSTPS-II	0.00
7	TSPTS	0.00
8	MTPS-II	16.24
9	MPL	0.00
10	NABINAGAR STPP	0.00
11	DSTPP	0.00
12	BRBCL	0.00

Annexure-XX

EASTERN REGIONAL POWER COMMITTEE, KOLKATA

AGC Settlement Account by ERPC from 01-04-2021 to 31-03-2022

Payments to the AGC Provider(s) from the DSM pool

Sr. No	AGC Provider	UP Regulation due to AGC (MWh)	Down Regulation due to AGC (MWh)	Net Energy (MWh)	Variable Charges (Rs.)	Markup Charges as per CERC Order (Rs.)	Total Charges (Rs.)
1	BARH	54485.2107	48204.2106	6281.0001	19734173	51344711	71078884
2	KHSTPP-II	27179.197	111465.2921	-84286.0951	-212010733	69322245	-142688488
3	MPL	55886.6831	184777.2008	-128890.5177	-338216287	120331942	-217884345
4	Teesta_V	3252.5525	2025.7247	1226.8278	1426802	2639139	4065941
5	NPGC	26200.4254	63191.648	-36991.2226	-77547658	44696037	-32851621
6	FSTPP I & II	2918.797	26076.922	-23158.125	-57922974	14497860	-43425114
7	FSTPP-III	1696.3597	4111.3123	-2414.9526	-6276469	2903836	-3372633
	Total	171619.2254	439852.3105	-268233.0851	-670813146	305735770	-365077376

Notes :

A) (+) means payable from DSM Pool to AGC provider. (-) means payable to DSM Pool by AGC provider.

B) AGC settlement account for the week 01-04-2021 to 31-03-2022 has been prepared based on the CERC order inpetition No.79/RC/2017, dated 06.12.2017.

C) The markup rate has been calculated at the rate of 50 Paise/Kwh for Up & Down regulation.

D) Variable Charges for AGC provider has been calculated as per the rate furnished by the respective RRAS providers in Format AS-I and the same published in ERPC website as format AS-3.

ANNEXURE - XXI

Under construction Thermal Power Projects of Eastern Region (As on 31.03.2022)

State	Project Name	Implementing Agency	Unit No.	Capacity (MW)	Anticipated Trial Run
Bihar	Barh STPP-I	NTPC	U-2	660	Dec-22
			U-3	660	Jul-23
	Buxar TPP	SJVN	U-1	660	Jun-23
			U-2	660	Dec-23
Jharkhand	North Karanpura STPP	NTPC	U-1	660	Jun-22
			U-2	660	May-23
			U-3	660	Jan-24
	Patratu STPP	JV of NTPC & JBVNL	U-1	800	Mar-24
			U-2	800	Sep-24
			U-3	800	Mar-25
West Bengal	Sagardighi Thermal Power Plant Ph-III	WBPDCL	U-1	660	Jan-24
			Total	**7680**	

Under construction Hydro Power Projects of Eastern Region (As on 31.03.2022)

State	Project Name	Implementing Agency	Unit No.	Unit Size & Capacity (MW)	Likely Commissioning Year
Sikkim	Teesta- VI	NHPC	U-1 to U-4	4x125	2023-24
	Rangit-IV	NHPC	U-1 to U-3	3x40	2024-25
	Bhasmey	Gati Infrastructure	U-1 to U-2	2X25.5	2025-26
	Rangit-II	Sikkim Hydro Power Ltd.	U-1 to U-2	2x33	2025-26
	Panan	Himgiri Hydro Energy Pvt. Ltd.	U-1 to U-4	4x75	2026-27
West Bengal	Rammam-III	NTPC	U-1 to U-3	3x40	2024-25
			Total	**1157**	

Annexure-XXII

Status of Construction of Transmission Lines (220 kV & Above) during the Year 2021-22 (As on 31.03.2022)

Name of Transmission Lines	Ckts (S/C) & (D/C)	Voltage Level (kV)	Total Length (cKm)	Progress Status of Transmission				Target Date		Remarks
				Total Locations (Nos)	Foundation completed (Nos)	Tower Erected (Nos)	Stringing completed (CKm)	Schedule	Revised/ Anticipated	
2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
POWER GRID CORPORATION OF INDIA LIMITED(PGCIL)										
LILO of Tilaiya - Balia line at Gaya	D/C	765								
Farakka - Malda (Reconductoring)	D/C	400	86	0			86	NOV-16	MAR-16	Line charged in Mar'16.
Jeerat (New) - Subhasgram (PM-JTL-TBCB)	D/C	400	214	312	266	234	82	JUL-20	FEB-22	Severe ROW being faced.
LILO of both Ckt. Kishanganj - Patna (Q) line Saharsa (ERSS XXITL - TBCB)	D/C	400	150	211	211	211	149	AUG-21	OCT-21	One ckt charged in 11.09.2021, 2nd ckt expected in October'21.
LILO of Gaya-Chandwa(existing) at North Karanpura STPP (Interim)	M/C	400	38					DEC-18		
LILO of Jeerat (WBSETCL) Subhasgram (PG)	D/C	400	1					JUL-20		
LILO of Jeerat (WBSETCL) - Subhasgram (PG) 400kV at Rajarhat (PM-JTL-TBCB)	D/C	400	24	37	0	0			JUL-20	Line deleted from scope.
LILO of Kishanganj (POWERGRID) - Darbhanga (DMTCL) (QUAD) line at Saharsa (New)	D/C	400	78	114	98	81	3	AUG-21	OCT-21	Severe RoW being faced in the Saharsa distt.
LILO OUT of Teesta-III - Kishanganj at Rangpo	D/C	400	15	35	35	35	23	JUN-20	AUG-21	Work affected due to RoW in stringing at one section due to Tashi Choling
Rajarhat - Purnea (excl. Farakka-Gokarna portion)	D/C	400	645	1219	1219	1219	645	APR-16	JUL-20	400 KV S/C New Purnea-Gokarna line & 400 KV S/C New Purnea-Farakka line
Re-conductoring of Maithon RB - Maithon line	D/C	400	63	0	0	0	42	AUG-21	NOV-21	Shutdown contraints from WBPTCL/ERLDC.
Siliguri - Purnea	D/C	400		0	0	0		SEP-13	MAY-20	
Purnea - Purnea (New)	D/C	220	2	0	0	0	2	MAY-20	DEC-19	Re-conductoring work completed & charged.
LILO of Gangtok - Melli at Rangpo	S/C	132	19							
DAMODAR VALLEY CORPORATION(DVC)										
MTPS - Ramgarh (Bypassing Gola SS)	S/C	220	207	687	685	683	204	JUL-21	MAY-22	Severe RoW encountered in a section of 3km at Village: Metala Dist: Purulia,
MTPS- Ranchi (PG) (Bypassing Gola SS)	S/C	220	228	784	782	780	225	JUL-21	MAY-22	Severe RoW encountered in a section of 3km at Village: Metala Dist: Purulia,
Parulia - Burdwan line	D/C	220	204	337	336	336	189	JUL-19	JUN-22	Severe RoW encountered in a section of 5.5km at Mouza - Galsi , Babla. Dist:

Status of Construction of Transmission Lines (220 kV & Above) during the Year 2021-22 (As on 31.03.2022)

Name of Transmission Lines	Ckts (S/C) & (D/C)	Voltage Level (kV)	Total Length (cKm)	Progress Status of Transmission				Target Date		Remarks
				Total Locations (Nos)	Foundation completed (Nos)	Tower Erected (Nos)	Stringing completed (CKm)	Schedule	Revised/ Anticipated	
2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
BIHAR STATE POWER TRANSMISSION COMPANY LIMITED(BSPTCL)										
LILO of Nabinagar -II - Patna (PG) at Jakkanpur (New)	D/C	400	7	0	0	0				M/s BGCL
LILO of (Quad) Barh - Patna at Bakhtiyarpur (New)	D/C	400	10	61	49	43		APR-21	APR-21	ROW issues.
2nd Circuit stringing of 220kV Darbhanga (400/220)-Samastipur (New) line	D/C	220	48	0	0	0	8	OCT-19	OCT-20	Work under progress
Amnour- Digha	D/C	220	48	0	0	0		JAN-22	JAN-22	
Bakhtiyarpur (New) - Fatuha (BSPTCL)	D/C	220	45	157	142	107	0	APR-21	APR-21	Work under progress.
Biharsharif - Asthawan (New)	D/C	220	40	0	0	0		MAY-21	MAY-21	
Karmnasa (New) - Pusauli (BSPTCL) (TM)	D/C	220	60	127	52	26	0		AUG-20	NOA issued and Work under progress.
LILO of Khagaul (BSPTCL) - Sipara (BSPTCL) at Jakkanpur (New)	S/C	220	10	0	0	0				M/s BGCL
LILO of Purnea (PG) - Khagaria (New) at Korha (New)	D/C	220	28	0	0	0		JAN-20	MAR-22	land not finalised yet
LILO of Sipara (BSPTCL) - Bihta (BSPTCL) at Jakkanpur (New)	D/C	220	7	0	0	0				M/s BGCL
LILO oof Ara (PG) - Khagaul (BSPTCL) at Naubatpur (New)	D/C	220	11	0	0	0				M/s BGCL
Muzaffarpur (PG) - Chhapra (New)	D/C	220	65	207	134	123	9	MAY-21	MAY-21	Work under progress.
Muzaffarpur (PG) - Gouraul line	D/C	220	20	70	55	55	3	MAY-21	MAY-21	Work in Progress.
Naubatpur (New) - Bhusaula (New)	D/C	220	18	0	0	0				M/s BGCL
Naubatpur (New) - Bhusaula (New)	D/C	220	18	0	0	0				M/s BGCL
Naubatpur (New) - Bihta (BSPTCL)	D/C	220	25	0	0	0				M/s BGCL
Pusouli (New) - Dehri	D/C	220	62	159	135	110	18	JUN-21	JUN-21	work under progress
Raxaul (New) - Gopalganj (TM/ Single Zebra)	D/C	220	130	201	118	64	0		JUN-20	NOA issued on 21.01.2019 and work under progress.
Saharsa (New) - Begusarai	D/C	220	186	289	178	136	0	AUG-21	AUG-21	NOA issued on 21.01.2019 and work under progress.
Saharsa (New) - Khagaria (New)	D/C	220	80	236	152	90	0	JUL-21	JUL-21	NOA issued on 21.01.2019.Work under progress.
Sheiikhopursarai-Asthawan (New)	D/C	220	37	0	0	0		MAY-21	MAY-21	
Sitamarhi (New) - Motihari (New)	D/C	220	120	0	0	0				This is the Same line as mentioned in Sr. no.34-Sitamarhi(New)-Raxual

Status of Construction of Transmission Lines (220 kV & Above) during the Year 2021-22 (As on 31.03.2022)

Name of Transmission Lines	Ckts (S/C) & (D/C)	Voltage Level (kV)	Total Length (cKm)	Progress Status of Transmission				Target Date		Remarks
				Total Locations (Nos)	Foundation completed (Nos)	Tower Erected (Nos)	Stringing completed (CKm)	Schedule	Revised/ Anticipated	
2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
JHARKHAND URJA SANCHAR NIGAM LTD. (JUSNL)										
Chandil - Chaibasa (PGCIL)	D/C	400	65	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Chandil - Dhanbad GSS	D/C	400	125	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Chandil New - Chaibasa (PG) line	D/C	400	0	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Dumka - Jasidih	D/C	400	70	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Koderma - Jasidih	D/C	400	130	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Latehar (JSUNL) - Patratu (JUSNL)	D/C	400	215	304	275	260	82	SEP-21	MAR-22	Stage-I clearances awaited.
LILO of Bero- Patratu at GSS Mander	D/C	400	15	0	0	0			MAR-24	"The RFQ & RFP floted by M/s RECTPCL has been cancelled. The decision for
LILO of one ckt QM Kahalgaon - Maithon at GSS Dumka	D/C	400	20	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA during MOM meeting & letter issued on 12.01.2018
OM Jasidih - Koderna GSS	D/C	400	135	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Patratu - Chandil GSS	D/C	400	135	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Patratu (JUSNL)- Bero (New Ranchi)	D/C	400	98	139	139	139	98	DEC-21	FEB-22	Commissioned 12/21 (Late Reported)..
Patratu New - Chandil New line	D/C	400	0	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Patratu New - Kodarma (JUSNL) line	D/C	400	0	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Patratu New - Patratu line	D/C	400	0	0	0	0			MAR-22	Project is being implemented by JUSNL. Tender is likely to be floated in Jul 20.
QM Koderma - Daltonganj	D/C	400	200	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
QM Koderma DVC TPS - Koderma JUSNL	D/C	400	15	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
QM North Karanpura - Latehar	D/C	400	100	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
QM Patratu - Koderma GSS	D/C	400	150	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Quad Essar (Latehar) - Chandwa TL	D/C	400	2	7	4	0			FEB-22	Work in Progress.
Quad Essar (Latehar) - Latehar (JUSNL) TL	D/C	400	81	122	122	120	43	SEP-21	FEB-22	Work in Progress.
TTPS - Dumka GSS	D/C	400	236	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
3 Ph. Baliyapur - Topchanchi	D/C	220	50	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
3 Ph. Giridih - Domchanch	D/C	220	90	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
3 Ph. Giridih - Topchanchi	D/C	220	60	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
3 Ph. Khunti - Mander (400kV GSS)	D/C	220	60	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
3 Ph. Khunti - Simdega	D/C	220	120	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
3 Ph. Koderma - Domchanch	D/C	220	16	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Chaibasa - Gua TL	D/C	220	168	278	127	110	0	JAN-22	JAN-22	Wildlife clearance issue.
Chandil (4ookV GSS) - Jadugoda	D/C	220	80	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Chandil GSS - Chandil	D/C	220	10	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Chandil GSS - Tamar	D/C	220	25	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Chandrapura DVC - Chandrapura	D/C	220	8	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Chatra - PBCMP (Barkagaon)	D/C	220	117	185	158	125	20	DEC-21	DEC-21	Work in Progress.
Giridih - Jamua	D/C	220	160	0	0	0		MAY-18		This line actually constructing at 132kV volatge level instead of 220kV voltage
Govindpur - Govindpur	D/C	220	7	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Hazaribagh - Barkatta	D/C	220	18	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Koderma (JSEB) - Koderma(DVC)	D/C	220	21	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Koderma - Giridih	D/C	220	140	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
LILO of 220kV D/C Govindpur -TTPS at Jainmore	D/C	220	70	92	82	67	24	SEP-21	SEP-21	Work in Progress.
LILO of both ckts Dumka - Govindpur at Palojori GSS	D/C	220	10	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been notified by Hon'ble JSERC. RFP has been issued to the selected bidders. Last
LILO of Chandil - Ranchi (PG) at Tamar	M/C	220	10	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
LILO of Hatia - Lohardaga at GSS Mander	D/C	220	10	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
LILO of Patratu - Hatia at PTPS by MC Tower	D/C	220		0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Link Line Daltonganj - Garhwa TL (Bhagodih END)	D/C	220	82	159	159	159	89	MAR-22	AUG-20	Link Line Daltonganj-Garhwa (both end Bhagodih end and Daltonganj end) has
Mander - Tamar	D/C	220	56	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Noamundi - Chaibasa (PG)	D/C	220	130	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Noamundi - Jadugoda	D/C	220	80	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Patratu - Ratu (Burmu) line	D/C	220	63	124	124	124	63	AUG-21	FEB-22	Commissioned 12/21 (Late Reported).
P.T.P.S. - Ratu	D/C	220	70	124	122	121	49	MAY-18	OCT-20	Tree Cutting Permission awaited for Hapua-Katia Proposal from DFO, Ramgarh.
Ratu - Mander	D/C	220	15	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Simdega - Chaibasa	D/C	220	165	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Tenughat - Chandrapura	D/C	220	55	0	0	0				Transmission line deleted as per last revised & approved list of project by CEA
Tenughat - Gomia	D/C	220	20	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been
Tenughat - Hazaribagh	D/C	220	135	0	0	0			MAR-22	Under PPP mode (TBCB) - Transmission Licensee Regulation 2019 has been

Status of Construction of Transmission Lines (220 kV & Above) during the Year 2021-22 (As on 31.03.2022)

Name of Transmission Lines	Ckts (S/C) & (D/C)	Voltage Level (kV)	Total Length (cKm)	Progress Status of Transmission				Target Date		Remarks
				Total Locations (Nos)	Foundation completed (Nos)	Tower Erected (Nos)	Stringing completed (CKm)	Schedule	Revised/ Anticipated	
2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
ORISSA POWER TRANSMISSION CORPORATION LTD.(OPTCL)										
Cuttack (OPTCL) - Pratapsasan	D/C	220	96	173	124	84	14		NOV-22	Total no. of location may be changed to 174 nos.
Kaonjhar (PG) - Turumunga S/s	D/C	220	35	66	33	31			JUL-22	
Katapalli-Kiakata	D/C	220	250	445	292	264	75	JAN-20	DEC-22	The no. of Towers may be revised to 440 nos.
Kesinga - Baliguda	D/C	220	200	376	322	299		JUN-17	MAR-23	Delayed due to forest clearance issue. The total locations may be revised to
LILO of Balimela-Malkangiri at Gobindpalli	S/C + D/C	220	80	146	146	146	21	MAR-20	MAY-22	The S/s charged through "T"connection. The line is delayed due Forest clearance issue.
LILO of Budhipadar - Tarkera at Bamra	S/C	220	13	39	38	35	9	DEC-21	JUN-22	The line length may be corrected as 11.6 Ckm
LILO of Budhipadar - Tarkera at Kuanramunda	S/C	220	61	65	55	53	13	OCT-21	MAY-22	The ckm should be 30.036 ckm. Schedule Completion may be made May 20
LILO of Duburi - Balasore at Dhamra	S/C	220	70	133	65	52	2		JUN-22	Schedule of Completion may be made as June 20
LILO of Joda -TTPS at Keonjhar (OPTCL)	D/C	220	31	52	33	31			OCT-22	
LILO of Narendrapur - Therubali at Aska S/S	D/C	220	86	161	115	106		FEB-22	MAY-22	
LILO of one Ckt. of Bhanjanagar -Meramundali at Daspalla	D/C	220	60	113	108	99	45	FEB-22	JUN-22	Forest issue
LILO of one ckt of Rengali - Tarkera at Deogarh	S/C	220	24					MAR-21		
Malkangiri - Kalimela	S/C	220	67	128	128	128	0	JAN-22	JUN-22	Delayed due to forest clearance issue
Pandiabili PGCIL - Pratapsasan line	D/C	220	58	114	114	113	57	AUG-21	MAR-22	The ckm may be changed to 61.20.
LILO of Aska - Bhanjanagar at Aska line	S/C	132	12	0	0	0		MAR-18		May be deleted as it is 132kV voltge level
WEST BENGAL STATE ELECTRICITY TRANSMISSION CO. LIMITED (WBSETCL)										
Gokarna - New Chanditala	D/C	400	360	532	521	510	327	SEP-21	JAN-22	work in progress
Bankura - New Bishnupur line (GEC-II)	D/C	220	0							
East Mednipur - Kharagpur line (GEC-II)	D/C	220	0							
Establishment of Barasat - Rajarhat (PG) utilising Barasat - Kasba	D/C	220	62						MAR-18	
Establishment of Rajarhat (PG) - New Town-Illutilishing Barasat - Kasba	D/C	220	2						MAR-18	
LILO of Arambag - Domjur at Mayapur	D/C	220	36						MAR-20	
LILO of BKTPP - Satgachia at Mahachhanda	D/C	220	14						MAR-19	
LILO ofc arambag - Midnapur at C.K.Road	D/C	220	232						MAR-21	
LILO of Sadaipur - Gokarna at Kotasur	D/C	220	8						MAR-20	
LILO of STPS - Durgapur at Asansole	S/C	220	60	122	53	38	0		APR-22	Work under Progress.
Rajarhat (PG) - New Town-II	D/C on M/C	220	56	58	2	2	1		MAR-19	Work of main line yet to be commenced due to mass resistance by the villagers
STPS - Raghunathpur	D/C	220	100						MAR-21	
West Mednipur - Kharagpur line (GEC-II)	D/C	220	0							
LILO of 132 kV One Ckt of Rammam-II - NBU at Rammam -III HEP	D/C	132	20	0	0	0		APR-19	DEC-21	"Survey work of the transmission lines completed. WBSETCL contemplated the ATS of Rammam III HPS of NTPC considering that WBSEDCL would
Rammam III - Chalsa	D/C	132	130	0	0	0		APR-19	DEC-21	"Survey work of the transmission lines completed. WBSETCL contemplated

ANNEXURE-XXIII

IMPORTANT MEETING HELD DURING 2021-22

A. ERPC MEETING

Sl.	Description	Date	Venue
1	44th ERPC Meeting	30.09.2021	The Vedic Village, Kolkata
2	45th ERPC Meeting	26.03.2022	The Indo Hokke Hotel, Rajgir (Bihar)

B. TCC MEETING

Sl.	Description	Date	Venue
1	44th TCC Meeting	29.09.2021	The Vedic Village, Kolkata
2.	45th TCC Meeting	25.03.2022	The Indo Hokke Hotel, Rajgir (Bihar)

C. OPERATION COORDINATION SUB-COMMITTEE (OCC) MEETINGS

Sl.	Description	Date	Venue
1.	178th OCC Meeting	20.04.2021	Through Video Conference (VC)
2.	179th OCC Meeting	21.05.2021	Through VC
3.	180th OCC Meeting	22.06.2021	Through VC
4.	181st OCC Meeting	22.07.2021	Through VC
5.	182nd OCC Meeting	24.08.2021	Through VC
6.	183rd OCC Meeting	20.09.2021	Through VC
7.	184th OCC Meeting	26.10.2021	Through VC
8.	185th OCC Meeting	23.11.2021	Through VC
9.	186th OCC Meeting	22.12.2021	Through VC
10.	187th OCC Meeting	21.01.2022	Through VC
11.	188th OCC Meeting	18.02.2022	Through VC
12.	189th OCC Meeting	16.03.2022	Through VC

D. COMMERCIAL SUB-COMMITTEE (CC) MEETINGS

Sl.	Description	Date	Venue
1	44th CC Meeting	07.07.2021	Through VC
2	45th CC Meeting	03.03.2022	Through VC

E. PROTECTION COORDINATION SUB-COMMITTEE (PCC) MEETINGS

Sl.	Description	Date	Venue
1.	101st PCC Meeting	13.04.2021	Through VC
2.	102nd PCC Meeting	13.05.2021	Through VC
3.	103rd PCC Meeting	17.06.2021	Through VC
4.	104th PCC Meeting	13.07.2021	Through VC
5.	105th PCC Meeting	23.08.2021	Through VC
6.	106th PCC Meeting	16.09.2021	Through VC
7.	107th PCC Meeting	22.10.2021	Through VC
8.	108th PCC Meeting	16.11.2021	Through VC
9.	109th PCC Meeting	16.12.2021	Through VC
10.	110th PCC Meeting	19.01.2022	Through VC
11.	111th PCC Meeting	11.02.2022	Through VC
12.	112th PCC Meeting	11.03.2022	Through VC

F. LOAD GENERATION BALANCE REPORT (LGBR) MEETING

Sl.	Description	Date	Venue
1	Mtg. on LGBR 2022-23	11.01.2022	Through VC

G. TELECOMMUNICATION, SCADA & TELEMETRY (TeST) MEETING

Sl.	Description	Date	Venue
1.	9th TeST Meeting	16.06.2021	Through VC
2.	10th Test Meeting	01.11.2021	Through VC

H. OCC SHUTDOWN MEETINGS

Sl.	Description	Date	Venue
1.	178th Outage Meeting	16.04.2021	Through VC
2.	179th Outage Meeting	17.05.2021	Through VC
3.	180th Outage Meeting	15.06.2021	Through VC
4.	181st Outage Meeting	16.07.2021	Through VC
5.	182nd Outage Meeting	13.08.2021	Through VC
6.	183rd Outage Meeting	15.09.2021	Through VC
7.	184th Outage Meeting	18.10.2021	Through VC
8.	185th Outage Meeting	18.11.2021	Through VC
9.	186th Outage Meeting	15.12.2021	Through VC
10.	187th Outage Meeting	17.01.2022	Through VC
11.	188th Outage Meeting	15.02.2022	Through VC
12.	189th Outage Meeting	14.03.2022	Through VC

I. SPECIAL MEETINGS

Sl.	Description	Date	Venue
1.	Special Meeting on Implementation of Islanding Scheme in Major Cities	01.04.2021	Through VC
2.	Review of GO&D Division's and RPCs work	05.04.2021	Through VC
3.	Special Meeting on Islanding Scheme	09.04.2021	Through VC
4.	Mtg. on disruption of electricity to Oxygen Generating Plants	04.05.2021	Through VC
5.	Special Meeting on Tr. Planning for Intrastate Constraints in Odisha System	10.05.2021	Through VC
6.	Special Meeting on Islanding Scheme	08.06.2021	Through VC
7.	Joint Study Committee Meeting	14.06.2021	Through VC
8.	Special Meeting on O/s RTA issues of Bihar	21.06.2021	Through VC
9.	Special Meeting on tripping of Generating Units	25.06.2021	Through VC
10.	Meeting on 26th Connectivity / LTA Generation Projects in ER	28.06.2021	Through VC
11.	Meeting on Operational & Protection issues in Jharkhand System	05.07.2021	Through VC
12.	Meeting with PWC	15.07.2021	Through VC
13.	3rd Mtg. of the Jt. Committee on TS	16.07.2021	Through VC
14.	4th ERPC TP Meeting	23.07.2021	Through VC
15.	Special Meeting on Implementation of SPS of Buripadar	04.08.2021	Through VC
16.	Special Meeting on Islanding Scheme	06.08.2021	Through VC
17.	Meeting of the Enquiry Committee on Power failure in NALCO Complex	16.08.2021	Through VC
18.	Meeting with Power Minister, Govt. of WB	26.08.2021	Through VC
19.	Meeting of CE (R&M), CEA	27.08.2021	Through VC
20.	Meeting with CERC	07.10.2021	Through VC
21.	Meeting with AIPM	27.10.2021	Through VC
22.	Special Meeting	02.11.2021	Through VC
23.	Meeting with CERC	17.11.2021	Through VC
24.	Training Programme on Disturbance Analysis using PSCT Software	06.12.2021 to 08.12.2021	Through VC
25.	Islanding PPT by CESC	08.12.2021	Through VC
26.	SCADA Conclave by ERLDC	23.12.2021	Through VC
27.	Meeting on Reserve S/d	10.01.2022	Through VC
28	Meeting on Plan Outage	11.01.2022	Through VC
29	Meeting on Failure of Tr. Lines	11.01.2022	Through VC
30	Meeting on Review constraints highlighted by POSOCO	12.01.2022	Through VC

J. NPC MEETINGS

Sl.	Description	Date	Venue
1.	10th NPC Meeting	09.04.2021	Through VC
2.	NPC Meeting	28.02.2022	Through VC

LTA Status of Eastern Region (As on 31.03.2022)

S. No.	Name of LTA Customer (Injecting utility)	Generator /Load/ Trader	Region	Quantum of LTA granted (MW)	LTA with tied up beneficiaries (in MW)	Name of the Beneficiaries
1	BRPL (DVC Power)	Load	ER	31	31	BRPL
2	BYPL (DVC Power)	Load	ER	19	19	BYPL
3	DVC (DVC Durgapur U#2)	Generator	ER	100	100	PSPCL
4	DVC (DVC Koderma U#1)	Generator	ER	100	100	Haryana
5	DVC (DVC Mejia U#7)	Load	ER	12.5	12.5	DVC
6	DVC (DVC Mejia U#8)	Load	ER	12.5	12.5	DVC
7	DVC (MPL U#1)	Load	ER	140.5	140.5	DVC
8	NDPL (DVC Power)	Load	ER	19.55	19.55	NDPL
9	WBSEDCL (MPL U #1&2)	Load	ER	141.375	141.375	WBSEDCL
10	WBSEDCL (MPL U#1&2)	Load	ER	141.375	141.375	WBSEDCL
11	Adhunik Power & Natural Resources Ltd	Generator	ER	100	100	WBSEDCL
12	Tata Steel Ltd (DVC, Mejia B)	Load	ER	100	100	Tata Steel
13	Tata Steel Ltd (DVC, DSTPS)	Load	ER	100	100	Tata Steel
14	Ind-Barath Energy (Utkal) Ltd, Odisha	Generator	ER	500	500	TANGEDCO, TN
15	KSEB (Maithon Power Ltd-RBTPP)	Load	ER	140.625	140.625	KSEB
16	BESCOM, Karnataka (Mejia 7&8, DVC)	Load	ER	200	200	BESCOM, Kar
17	Adhunik Power & Natural Resources Ltd	Generator	ER	100	100	TANGEDCO, TN
18	DVC, Raghunathpur (Unit-1 & 2)	Generator	ER	100	100	Haryana (U1-50MW & U2-50MW)
19	GMR Kamalanga Energy Ltd	Generator	ER	387	312	Haryana (312 MW)
20	DVC, Raghunathpur (Unit-1 & 2)	Generator	ER	300	300	Punjab (U1-150 MW & U2-150 MW)
21	KSEB (Maithon Power Ltd-RBTPP)	Load	ER	140.625	140.625	KSEB
22	GMR Kamalanga Energy Ltd	Generator	ER	260	260	Bihar (260 MW)
23	Bhartiya Rail Bijlee Company Limited(BRBCL)	Generator	ER	910	910	ECR {Bihar-100 MW, DVC- 110 MW,Maharashtra-120 MW, MP-209 MW, UP-150 MW, Haryana- 55 MW, Punjab - 35 MW, Rajasthan- 10 MW, Delhi-15 MW, Karnataka -10 MW, Assam-5 MW} & BSP(H)CL, Bihar (91 MW)
24	Jndal India Thermal Power Ltd (JITPL), Odisha (2x600MW)	Generator	ER	95	95	KSEB Ltd, Kerala
25	WBSEDCL, West Bengal (1000MW State Surplus)	DIC	ER	1000	0	NA
26	PSPCL (Bokaro TPS, DVC Power)	Load	ER	200	200	PSPCL
27	Kanti Bijlee Utpadan Nigam Ltd.	Generator	ER	121.59	121.59	As per the MoP allocation to be decided by respective RPC
28	PTC (Teesta-III HEP)	Trader	ER	174	174	UP
29	PTC (Teesta-III HEP)	Trader	ER	87	87	RAJASTHAN
30	Jndal India Thermal Power Ltd (JITPL), Odisha (2x600MW)	Generator	ER	228	228	Bihar Discoms
31	NVVNL (injection is from DVC, West Bengal)	Trader	ER	300	300	NVVNL, BPDB
32	Gati Infrastructure Limited,Chuzachen HEP (2x55MW)	Generator	ER	99	99	Haryana
33	Dans Energy Private Limited,Jorethang HEP (2x48MW)	Generator	ER	86.4	0	
34	Shiga Energy Private Limite, Tashiding HEP (2x48.5MW)	Generator	ER	87.3	0	
35	Nabinagar Power Generating Company Limited	Generator	ER	1856.25	1856.25	North Bihar- 543.55 MW, South Bihar - 911.92 MW, Sikkim - 9.37 MW, Jharkhand- 56.25 MW, UP- 195.94 MW, Unallocated -139.22 MW
36	NTPC Darli Palli	Generator	ER	1498	1498	Bihar = 151.125MW, West Bengal = 233.91MW, Jharkhand = 117.64MW, Sikkim = 22.32MW, Unallocated = 225MW Odisha = 748MW
37	Madhya Bharat Power Coporation Limited (2x56.49 MW)	Generator	ER	113	113	CSPDCL

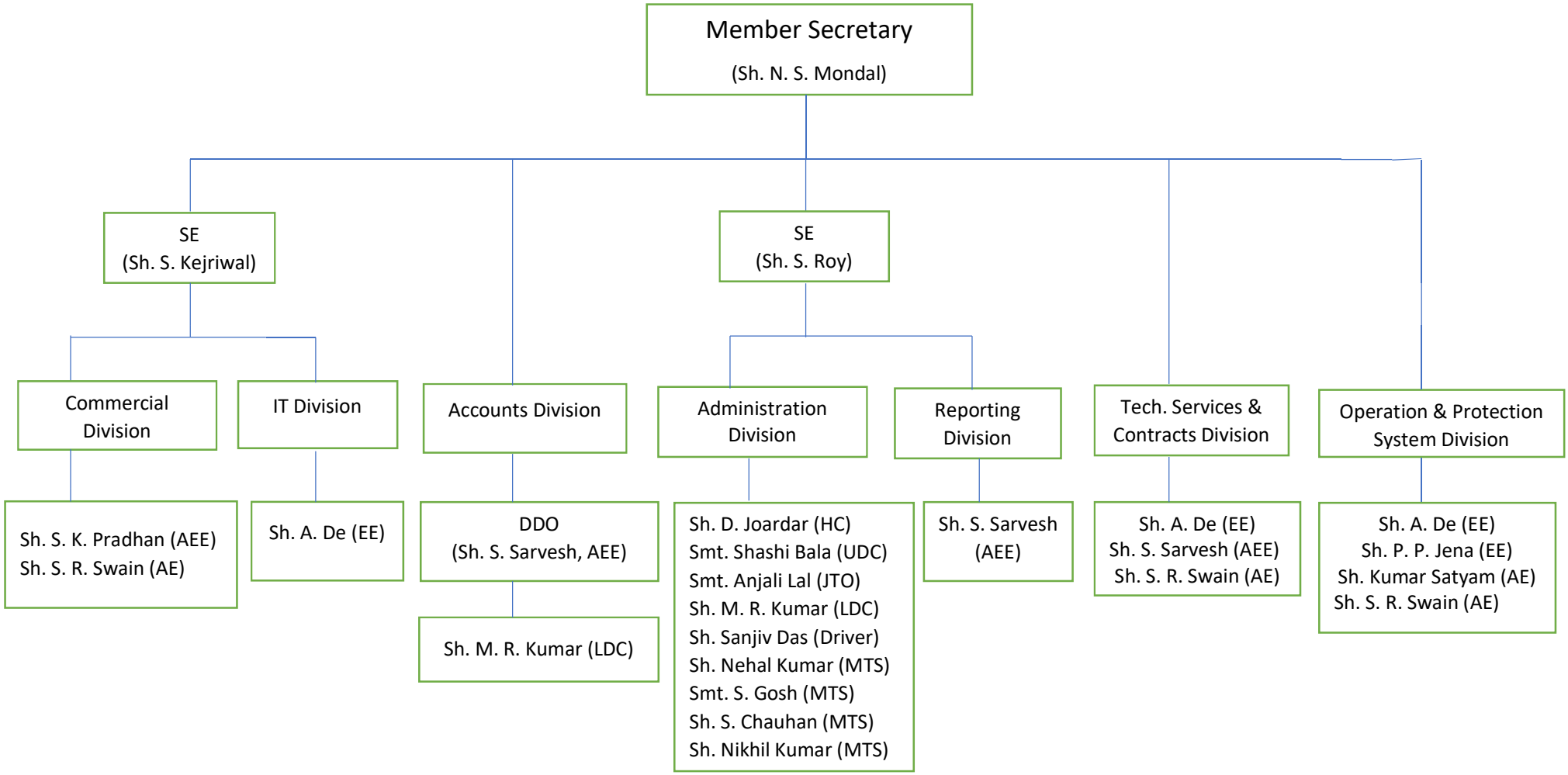
MTOA Status of Eastern Region (As on 31.03.2022)

Sl. No.	Name of the Applicant	Injection of Power		MTOA Granted from 01.03.2022 to 11.12.2024 (MW)	Drawl of Power	
		Generating Station	Region		Region	Entity / Location of Loads
1	Jindal India Thermal Power Limited (JITPL)	JITPL, Odisha	ER	106.88	NR	Northern Railways, UP

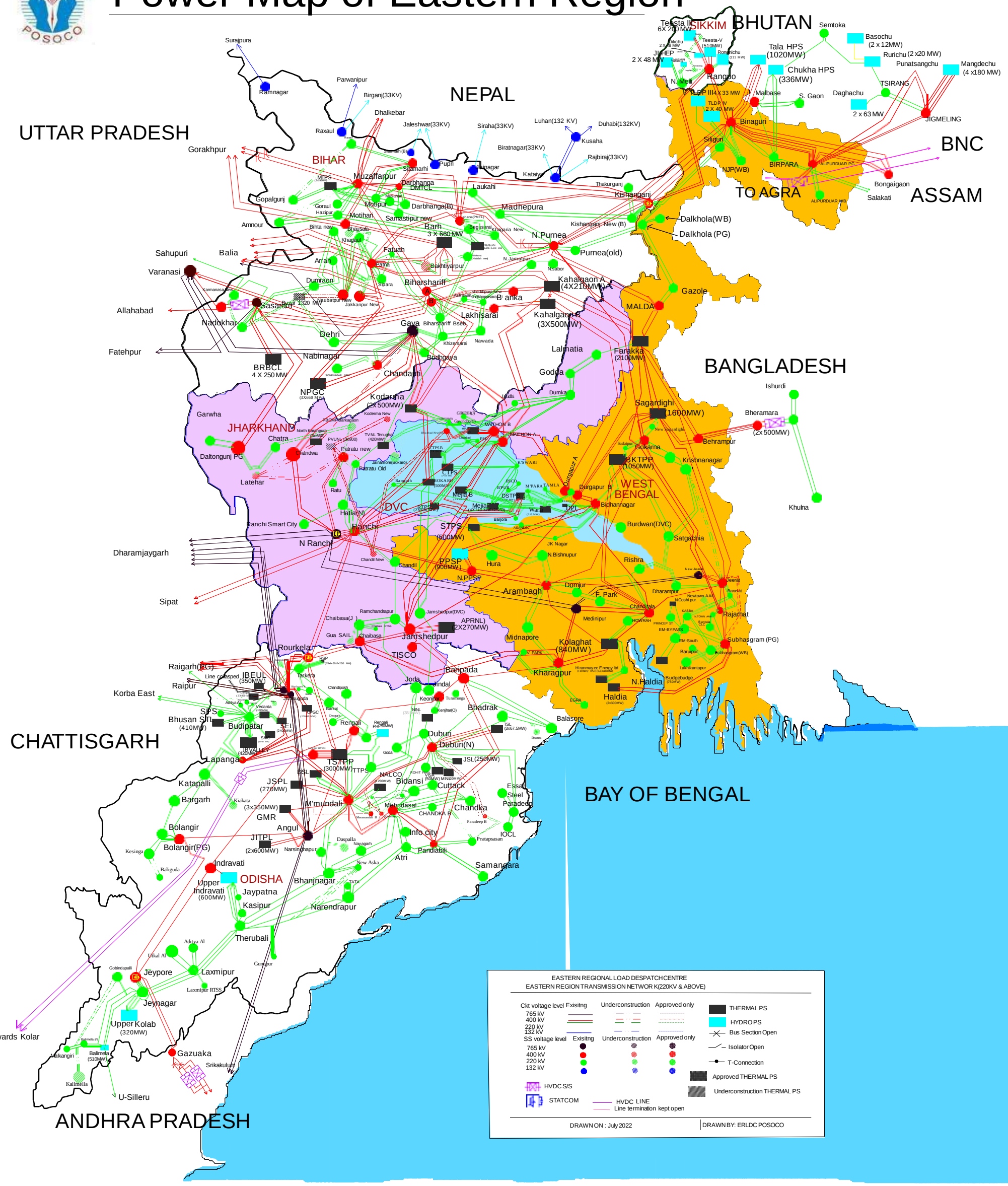
EXHIBIT - I

Organisation Chart of ERPC Secretariat, Kolkata

(As on 31.03.2022)



Power Map of Eastern Region



SINGLE LINE DIAGRAM: ER TRANSMISSION SYSTEM(220KV & ABOVE)