सत्यमेव जयते

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

सेवा में /To

As per list of Addresses

विषय:ट्रांसमिशन पर राष्ट्रीय समिति (एनसीटी) की पन्द्रहवी बैठक का कार्यवृत - के सम्बन्ध में ।

Subject: Minutes of the 15th Meeting of National Committee on Transmission (NCT) – regarding.

महोदया (Madam) / महोदय (Sir),

The 15th meeting of the "National Committee on Transmission" (NCT) was held on 25th August, 2023. The minutes of the meeting are enclosed herewith.

भवदीय/Yours faithfully,

18/11/2023

(राकेश गोयल / Rakesh Goyal)
मुख्य अभियन्ता एवं सदस्य सचिव,एन.सी.टी.
/ Chief Engineer & Member Secretary (NCT)

प्रतिलिपि / **Copy to:**

Joint Secretary (Trans), Ministry of Power, New Delhi

List of Addresses:

1.	Chairperson, Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	2.	Member (Power System), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.
3.	Member (Economic & Commercial), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	4.	Director (Trans), Ministry of Power Shram Shakti Bhawan, New Delhi-110001.
5.	Sh. Ajay Yadav, Joint Secretary Room no 403, Atal Akshay Urja Bhawan Opposite CGO Complex gate no 2, Lodhi Road, New Delhi – 110003	6.	Chief Operating Officer, CTUIL, Saudamini, Plot No. 2, Sector-29, Gurgaon – 122 001.
7.	Sh. Rajnath Ram, Adviser (Energy), NITI Aayog, Parliament Street, New Delhi – 110 001.	8.	CMD, Grid Controller of India, B-9, Qutub, Institutional Area, Katwaria Sarai, New Delhi – 110010
9.	Ms. Seema Gupta, Ex. Director (Operations), POWERGRID	10.	Sh. Ravinder Gupta, Ex. Chief Engineer, CEA

Special Invitee

Chief Engineer (PCD), CEA

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Minutes of the 15th meeting of National Committee on Transmission

1 Confirmation of the minutes of the 14th meeting of National Committee on Transmission.

1.1 The minutes of the 14th meeting of NCT held on 09.06.2023 were issued vide CEA letter no CEA-PS-12-13/3/2019-PSPA-II dated 07.07.2023.

1.2 Further, a corrigendum to the minutes was issued vide CEA letter dated 10.08.2023 with following modifications:

Para 3.2.12:

Sl. No. 8 of the table of para 3.2.12 is modified as below:

8.	80 MVAR, 420 kV switchable Line Reactors at Pune-III (GIS) end of Pune-III (GIS) – Koyna 400 kV S/c line formed after above LILO (with NGR bypass arrangement).	• 80 MVAR, 420 kV switchable line reactor along with switching equipment- 1 No.

Sl.no. viii of Row 4 of table under IV (b) of Summary of the deliberations of the 14th meeting of NCT held on 09th June, 2023 is modified as below:

"80 MVAR, 420 kV switchable Line Reactors at Pune-III (GIS) end of Pune-III (GIS) – Koyna 400 kV S/c line formed after above LILO (with NGR bypass arrangement)."

Para 3.5.8:

Sl. No. 2 under Column: Scope of the Transmission Scheme of the table of para 3.5.8 is modified as below:

"Fatehgarh-IV (Section-2) PS – Bhinmal (PG) 400 kV D/c line (Twin HTLS*) along with 50 MVAR switchable line reactor on each ckt at each end

Sl. No. 3 under Column: Scope of the Transmission Scheme of the table of para 3.5.8 is modified as below:

LILO of both ckts of 765 kV Fatehgarh-III- Beawar D/c line at Fatehgarh-IV (Section-2) PS along with 330 MVAR switchable line reactor at Fatehgarh-IV PS end of each ckt of 765 kV Fatehgarh-IV- Beawar D/c line (formed after LILO)"

The following is added at the end of table of para 3.5.8:

* with minimum capacity of 2100 MVA on each circuit at nominal voltage.

Sl. No. iii of Row 8 of table under IV (b) of Summary of the deliberations of the 14th meeting of NCT held on 09th June, 2023 is modified as below:

"LILO of both ckts of 765 kV Fatehgarh-III- Beawar D/c line at Fatehgarh-IV (Section-2) PS along with 330 MVAR switchable line reactor at Fatehgarh-IV PS end

of each ckt of 765 kV Fatehgarh-IV- Beawar D/c line (formed after LILO)"

1.3 It was opined that CTUIL should prepare a standard checklist so that the finer details are not missed out. The checklist to be submitted to NCT in the next meeting.

1.4 Members confirmed the minutes along with the corrigendum.

2 Status of the transmission schemes noted/approved/recommended to MoP in the 14th meeting of NCT:

2.1 The status of the transmission schemes noted/approved/recommended in the 14th meeting of NCT is tabulated below:

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	MoP approval	Survey Agency	BPC
1.	Requirement of additional FOTE of STM-16 capacity at Bhuj PS to cater to connectivity of RE Gencos	Approved	RTM	Not Applicable	Not Applicable	Not applicable
2.	Requirement of additional FOTE of STM-16 capacity at Bhuj-II substation to cater to connectivity of RE Gencos	Approved	RTM	Not applicable	Not Applicable	Not applicable
3.	Upgradation of STM-4 communication link of Dehgam, Ranchhodpura, Santhalpur Rep, Bhachau and CGPL Mundra to STM-16 capacity	Approved	RTM	Not applicable	Not Applicable	Not applicable
4.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-V (8 GW): Part A1	Approved	RTM	Not applicable	Not Applicable	Not applicable
5.	Transmission system for evacuation of power from Rajasthan	Approved	RTM	Not applicable	Not Applicable	Not applicable

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	MoP approval	Survey Agency	BPC
	REZ Ph-IV (Part-2 :5.5 GW) (Jaisalmer/Barmer Complex): Part H2					
6.	Augmentation of transformation capacity by 1x1500 MVA (3rd), 765/400 kV ICT at Maheshwaram (PG) substation in Telangana	Approved	RTM	Not applicable	Not Applicable	Not applicable
7.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part E1	Approved	RTM	Not applicable	Not Applicable	Not applicable
8.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part E3	Approved	RTM	Not applicable	Not Applicable	Not applicable
9.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part E4	Approved	RTM	Not applicable	Not Applicable	Not applicable
10.	Western Region Network Expansion scheme in Kallam area of Maharashtra	Approved	TBCB	Not applicable	RECPDCL	RECPDCL
11.	Transmission System	Recommended	TBCB	To be approved	RECPDCL	RECPDCL

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	MoP approval	Survey Agency	BPC
	for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part A					
12.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part B	Recommended	TBCB	To be approved	PFCCL	PFCCL
13.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part C	Recommended	TBCB	To be approved	RECPDCL	RECPDCL
14.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part D	Recommended	TBCB	To be approved	PFCCL	PFCCL
15.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-IV (7 GW): Part E2	Recommended	TBCB	To be approved	RECPDCL	RECPDCL
16.	Transmission System for Evacuation of Power from potential	Recommended	TBCB	To be approved	RECPDCL	RECPDCL

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	MoP approval	Survey Agency	BPC
	renewable energy zone in Khavda area of Gujarat under Phase-V (8 GW): Part A					
17.	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-V (8 GW): Part C	Recommended	TBCB	To be approved	PFCCL	PFCCL
18.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2 :5.5 GW) (Jaisalmer/Barmer Complex): Part A	Recommended	TBCB	To be approved	RECPDCL	RECPDCL
19.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2 :5.5 GW) (Jaisalmer/Barmer Complex): Part B	Recommended	TBCB	To be approved	PFCCL	PFCCL
20.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2 :5.5 GW) (Jaisalmer/Barmer Complex): Part C	Recommended	TBCB	To be approved	CTUIL	RECPDCL
21.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2 :5.5 GW)	Recommended	TBCB	To be approved	CTUIL	RECPDCL

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	MoP approval	Survey Agency	BPC
	(Jaisalmer/Barmer Complex): Part D					
22.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2 :5.5 GW) (Jaisalmer/Barmer Complex): Part E	Recommended	TBCB	To be approved	RECPDCL	RECPDCL
23.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2 :5.5 GW) (Jaisalmer/Barmer Complex): Part F (By clubbing Part F1 & F2)	Recommended	TBCB	To be approved	PFCCL	PFCCL
24.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2 :5.5 GW) (Jaisalmer/Barmer Complex): Part H1	Recommended	TBCB	To be approved	RECPDCL	RECPDCL

3 Modifications in the earlier approved/notified transmission schemes:

3.1 Termination of Bidar – Maheshwaram 765 kV D/c line alongwith 240 MVAr switchable line reactor at Maheshwaram end under the "Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka".

3.1.1 Bidar - Maheshwaram (PG) 765 kV D/c line was identified with 240 MVAr switchable line reactor only at Bidar end considering 160 km line length. The NGR of 600 ohms was included as part of RfP details. However, as confirmed by the BPC (RECPDCL), the line length has changed to ~242 km after survey. Accordingly, revised analysis has been carried out for reactive compensation and NGR with revised

line length and it was found that 240 MVAr switchable line reactor is required at both Bidar & Maheshwaram PS ends. Further, ohmic value of NGR of 500 ohms for Line Reactors may be considered.

3.1.2 The revised scope has already been communicated to the BPC. As per the status of the scheme as provided by RECPDCL, the scheme is under bidding with bid submission deadline as 05.09.2023.

3.1.3 Changes in the scheme is summarised below:

Original Scope	**Revised Scope**
765 kV, 1x240 MVAR Switchable Line Reactor for each circuit at Bidar PS end of Bidar PS- Maheshwaram (PG) GIS 765 kV D/C line	765 kV, 1x240 MVAR Switchable Line Reactor for each circuit at Bidar PS end **& Maheshwaram (PG) end** of Bidar PS – Maheshwaram (PG) GIS 765 kV D/C line
Note: POWERGRID to provide space for 2 Nos. of 765 kV line bays at Maheshwaram (PG) substation for termination of Bidar PS – Maheshwaram (PG) 765 kV D/c line.	Note: POWERGRID shall provide space for 2 no. of 765 kV line bays **with provision for 240 MVAr SLR at** Maheshwaram (PG) substation for termination of Bidar PS – Maheshwaram (PG) 765 kV D/c line.

3.1.4 Modified transmission scheme is given below:

Sl. No.	**Revised Scope of the Transmission Scheme**	**Capacity/km**
1.	Establishment of 765/400 kV 3x1500 MVA, 400/220 kV 5x500 MVA pooling station at suitable border location near Bidar with 765 kV (1x240 MVAR) and 400 kV (1x125 MVAR) Bus Reactor **<u>765 kV Future Provision</u>** i) Space for future 765/400 kV ICT along with associated bay: 1 no. ii) Space for future 765 kV Bus Reactor along with associated bay: 1 no. iii) Space for additional future line bays with SLR: 8 nos. iv) Space for additional future 765/400 kV ICT along with associated bay: 2 nos. **<u>400 kV Future Provision</u>**	765/400 kV, 1500 MVA, ICTs – 3 Nos. (10x500 MVA including 1 spare unit) 500 MVA, 400/220 kV ICT – 5 Nos. 765 kV ICT bays – 3 Nos. 400 kV ICT bays – 8 Nos. 220 kV ICT bays – 5 Nos. 765 kV line bays – 2 Nos. 220 kV line bays – 8 Nos. 765 kV, 240 MVAr Bus reactor – 1 No. (3x80 MVAr) 765 kV Bus reactor bays – 1 No.

	i) Space for future line bay: 8 nos. ii) Space for future 765/400 kV ICT bay: 1 no. iii) Space for future 400/220 kV ICT along with associated bay: 2 nos. iv) Space for additional future line bay with SLR: 2 nos. v) Space for additional future 765/400 kV ICT bay: 2 nos. vi) Space for additional future 400/220 kV ICT along with associated bay: 4 nos. **<u>220 kV Future Provision</u>** i) Space for future 400/220 kV ICT bays: 2 nos. ii) Space for future line bays: 4 nos. iii) Space for additional future 400/220 kV ICT bays: 4 nos. iv) Space for additional future line bay: 6 nos. v) Space for additional future 220 kV Bus Sectionalizer: 2 sets vi) Space for additional future 220 kV TBC bay: 2 nos. vii) Space for additional future 220 kV BC bay: 2 nos.	125 MVAr, 420 kV Bus reactor – 1 No. 420 kV Bus reactor bay – 1 No. 220 kV Bus sectionalizer– 1set. 220 kV Bus coupler bays – 2 Nos. 220 kV Transfer Bus Coupler bays – 2 Nos.
2.	Bidar PS – Maheshwaram (PG) 765 kV D/C line	**Route Length – 242 km**
3.	2 nos. of 765 kV line bays at Maheshwaram (PG) GIS substation for termination of Bidar PS – Maheshwaram (PG) GIS 765 kV D/C line	765 kV line bays (GIS) - 2
4.	765 kV, 1x240 MVAR Switchable Line Reactor for each circuit at Bidar PS end **& Maheshwaram (PG) end** of Bidar PS-Maheshwaram (PG) GIS 765 kV D/C line	240 MVAr, 765 kV line reactor – 4 Nos. [7x80 MVAr at Bidar PS and 7x80 MVAr at Maheshwaram (PG), including 1 spare unit for both Bus Reactor & Line Reactor] Switching equipments for 765 kV reactor – 2 Nos. each at Bidar PS & Maheshwaram.

Note: *POWERGRID shall provide space for 2 no. of 765 kV line bays* ***with provision for 240 MVAr SLR at*** *Maheshwaram (PG) substation for termination of Bidar PS – Maheshwaram (PG) 765 kV D/c line*

3.1.5 NCT cost committee in its meeting dated 10.08.2023, has estimated the cost for Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka which is under bidding as Rs. 2385.11 Crs considering increased line length of 241.67 km

for Bidar PS – Maheshwaram (PG) 765 kV D/C line with additional 2x240 MVAR switchable line at Maheshwaram (PG) end.

3.1.6 Addition of 2 (two) Nos. of 240 MVAr, 765 kV SLR at Maheshwaram (PG) has resulted in increase in cost of the transmission scheme by about Rs. 55 Crores (approx.) and increase in line length has resulted in increase in the cost of the transmission scheme by about Rs. 400 Crores (approx.). The change in estimated cost of the transmission scheme is more than 5 %.

3.1.7 After detailed deliberations, the revised scope of the scheme "Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka" was recommended by NCT to MoP.

3.2 **Addition in scope of works in OM dated 22.02.2023 to facilitate termination of Bidar – Maheshwaram 765 kV D/c line alongwith 240 MVAr switchable line reactor at Maheshwaram end under the "Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka"**

3.2.1 "Transmission Scheme for evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) / Solar Energy Zone (1500 MW)" Part A and Part B is under implementation by POWERGRID through RTM mode as per the scope allotted vide MoP OM dated 22.02.2023. The scheme also includes construction of Kurnool-III – Maheshwaram (PG) 765 kV D/c line.

3.2.2 One of the circuit of Bidar – Maheshwaram (PG) 765 kV D/c line (under the Transmission Scheme for Solar Energy Zone in Bidar, 2500 MW, Karnataka) is to be terminated in the GIS diameter at Maheshwaram (PG) end being constructed by POWERGRID under the "Transmission Scheme for evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) /Solar Energy Zone (1500 MW)" Part A and Part B.

3.2.3 Subsequently, CTUIL vide email dated 18.05.2023 to CEA/BPC has informed that due to substantial change in line length of Bidar – Maheshwaram 765 kV D/c line, 240 MVAr switchable line reactor is required at both Bidar & Maheshwaram ends.

3.2.4 To incorporate 240 MVAr switchable line reactor at Maheshwaram (PG) end, GIS module for the line GIS bay for Bidar – Maheshwaram 765 kV D/c line has to be constructed with provision of Reactor GIS Bay along with Auxiliary Bus.

3.2.5 In view of the above technical requirement for provision of GIS bay for 240 MVAr switchable line reactor at Maheshwaram end, POWERGRID has requested for change of scope / addendum to MoP OM dated 22.02.2023, for incorporation of suitable provision in GIS bay at Maheshwaram for installation of 240 MVAr switchable line reactor by the TSP for "Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka".

3.2.6 The tentative cost of the GIS module at Maheshwaram S/s of POWERGRID is about Rs. 13 Crores, which is within 5 % limit of the project cost of the transmission scheme allocated under RTM to POWERGRID.

3.2.7 After deliberations, following provision was approved to be added in the detailed scope of works for "Transmission Scheme for evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) /Solar Energy Zone (1500 MW) Part A and Part B" for GIS bay at Maheshwaram for installation of 240 MVAr switchable line reactor by the TSP.

- Suitable 765 kV GIS module (1 No.) at Maheshwaram end in the GIS diameter under implementation as part of "Transmission Scheme for evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) / Solar Energy Zone (1500 MW) Part A and Part B", to facilitate termination of Bidar – Maheshwaram 765 kV D/c line alongwith 240 MVAr switchable line reactor at Maheshwaram end by TSP for "Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka"

3.3 Transmission system for evacuation of power from Shongtong Karcham HEP (450 MW) and Tidong HEP (150 MW)

3.3.1 A comprehensive transmission scheme for evacuation of power from two Hydro Electric Projects (HEPs) viz Tidong (150 MW) of Tidong Power Generation Private Limited (STATKRAFT) and Shongtong Karcham HEP (450 MW) of HPPCL in Himachal Pradesh has been evolved. The transmission scheme was approved by MoP based on the recommendation by NCT for implementation through TBCB route.

3.3.2 Subsequently, HPPCL had intimated that the commissioning date of Shongtong Karcham HEP had been revised (preponed) from July'26 to July'25 and requested to review the timelines of the transmission system for evacuation of power from Shongtong Karcham HEP (STKHEP) in Himachal Pradesh due to the revised timeline of commissioning of Shongtong Karcham HEP.

3.3.3 Accordingly, the transmission scheme was bifurcated in two parts (interim and final scheme) and the same was discussed in the 65th NRPC meeting held on 21.04.2023. During the NRPC meeting, MS, NRPC stated that all efforts may be made to reduce the time frame of the interim part to ensure that the generation is not stranded. Therefore, NRPC recommended NCT to consider generation project schedule and accordingly transmission system may be developed.

3.3.4 In the 14th NCT meeting, CTUIL informed that based on the preliminary survey report for 400 kV Wangtoo-Panchkula D/c line, conductor in certain portion of the transmission line may need to be of different configuration (due to very high altitude encountered in certain sections) in order to avoid Corona inception gradient. The cost of the transmission scheme may also increase. Accordingly, CTUIL was requested to

confirm change in conductor configuration, if any, along with revised cost of the scheme based on the survey report and submit the same within two weeks.

3.3.5 In this regard, meetings were held between CEA and CTUIL to review the selection of conductors for 400 kV D/C Panchkula - Wangtoo line. Further, study report of M/s RSW(Canada) for the 400 kV D/C Nathpa Jhakri- Abdullapur line (running parallel to the proposed line) were also referred. From survey report, CTU observed that line shall be traversing high altitudes upto 2700 m and around 49% (85 km) of the line would be between 2000 m and 2700 m altitude, based on which various options for conductor selection were evaluated.

3.3.6 CTU also informed that during walkover survey, it emerged that line length of 400 kV Wangtoo -Panchkula D/c line is reduced to 175 km from 210 km in earlier approved proposal. CTU Cost committee revised the cost of transmission scheme considering Quad Moose configuration with revised length of 175 km. With change in conductor configuration and length of 400 kV Wangtoo (HPPTCL) – Panchkula (PG) D/c line, cost of composite transmission scheme increases by about Rs 56 Cr.

3.3.7 Accordingly, detailed scope of the scheme along with changes from earlier transmission scheme (approved in 65th NRPC meeting and discussed in 14th NCT meeting and subsequently between CEA & CTUIL) is given below:

Sl. No.	Scope of the Transmission Scheme (as per 14th NCT agenda)	Revised Scope of the Transmission Scheme
1.	**Interim Part (For Shongtong HEP: with time frame of 24 months)** Generation switchyard of Shongtong HEP** to Wangtoo (HPPTCL) 400 kV D/c line (Quad[$)] • Route length- 18 km 2 nos. of 400 kV bays (GIS) at Wangtoo (HPPTCL) ** *Associated 400 kV bays at Shongtong Generation switchyard shall be under the scope of applicant/generation developer* *Note: HPPTCL shall provide space for two number of 400kV line bays (GIS) at Wangtoo (HPPTCL) substation for termination of the 400kV line*	**Interim Part (For Shongtong HEP: with time frame of 24 months)** **1) -No Change-** **2) -No Change-**

Sl. No.	Scope of the Transmission Scheme (as per 14th NCT agenda)	Revised Scope of the Transmission Scheme
2.	**Final System (To be matching with Tidong generator requirement ie. with time frame of 1st July 2026)** Establishment of 2x315 MVA (7x105 MVA 1-ph units including one spare unit), 400/220 kV GIS Pooling Station at Jhangi^ • 400/220 kV ICTs – 2x315 MVA (7x105 MVA 1-ph units including one spare unit) • 400 kV ICT bays – 2 Nos. • 220 kV ICT bay -2 Nos. • 220 kV Bus coupler- 1 No. • 400 kV line bays (GIS) – 3 Nos. (2 nos. for extension of Wangtoo (HPPTCL) – Shongtong HEP 400 kV (Quad$) D/c line upto Jhangi PS with one circuit through Shongtong HEP generation switchyard) & 1 nos. for GIS Diameter completion at Jhangi • 420 kV Bus reactor- 1 No. (4x41.66 single phase units including one spare unit) • 420 kV reactor bay – 1 No. **Future provisions (Space for):** • 400 kV line bays-4 Nos. • 220 kV line bays for future projects-6 Nos (Out of above 6 bays, space for 2 bays to be utilized for connectivity to Tidong generation) • 400/220 kV ICT-2 Nos. • 420 kV Bus Reactor along with associated bay - 1 No.	**Final System (To be matching with Tidong HEP requirement i.e. with time frame of 1st July 2026)** **-No Change—** **No Change—**

Sl. No.	Scope of the Transmission Scheme (as per 14th NCT agenda)	Revised Scope of the Transmission Scheme
	• 220 kV Sectionalization bay: 1 set • Bus Coupler: 1 No. Extension of Wangtoo (HPPTCL) - Shongtong HEP 400 kV (Quad[$]) D/c line upto Jhangi PS with one circuit through Shongtong HEP generation switchyard • Route length- 37 km **Wangtoo (HPPTCL) - Panchkula (PG) 400 kV D/c line* (twin HTLS)** • **Route length- 210 km** 80 MVAR switchable line reactor at Panchkula end on each circuit of 400 kV Wangtoo (HPPTCL) - Panchkula (PG) D/c line 400 kV bays at Wangtoo S/s (2 nos.-GIS) and Panchkula S/s (2 nos.-AIS) for termination of 400 kV Wangtoo (HPPTCL) - Panchkula (PG) D/c line *[$] Line capacity shall be 2500 MVA per circuit at Nominal voltage* ***<u>* with minimum capacity of 2100 MVA on each circuit at Nominal voltage</u>*** **Note:** *i. Developer of Shongtong HEP to provide 2 nos. of 400kV bays at Shongtong switchyard for LILO of one circuit of Jhangi PS - Wangtoo (HPPTCL) 400 kV D/c (Quad) line at generation switchyard of Shongtong HEP* *i. HPPTCL to provide space for two number of 400kV line bays (GIS) at Wangtoo (HPPTCL) substation for termination Wangtoo - Panchkula (PG) D/c line*	**Wangtoo (HPPTCL) - Panchkula (PG) 400 kV D/c line* (Quad Moose/AL59/Triple HTLS)** • **Route length- 175 km** **Change in line length and conductor configuration** **-No Change—** **-No Change--** **Note:** *i. Developer of Shongtong HEP to provide 2 nos. of 400kV bays at Shongtong switchyard for LILO of one circuit of Jhangi PS - Wangtoo (HPPTCL) 400 kV D/c (Quad) line at generation switchyard of Shongtong HEP* *ii. HPPTCL to provide space for two*

Sl. No.	Scope of the Transmission Scheme (as per 14th NCT agenda)	Revised Scope of the Transmission Scheme
	i. Power Grid to provide space at 2 nos. of 400 kV bays alongwith SLR at Panchkula S/s for termination of Wangtoo (HPPTCL) - Panchkula (PG) D/c line *v. Tidong HEP- Jhangi PS 220 kV D/C line (along with associated bays at both ends)- under the scope of applicant/generation developer* *v. The line lengths indicated above are approximate as the actual line length would be obtained after detailed survey.*	*number of 400kV line bays (GIS) at Wangtoo (HPPTCL) substation for termination Wangtoo - Panchkula (PG) D/c line* *ii. Power Grid to provide space at 2 nos. of 400 kV bays alongwith SLR at Panchkula S/s for termination of Wangtoo (HPPTCL) - Panchkula (PG) D/c line* *iv. Tidong HEP- Jhangi PS 220 kV D/C line (along with associated bays at both ends)- under the scope of applicant/generation developer* *The line lengths indicated above are approximate as the actual line length would be obtained after detailed survey.*
	Estimated Cost: Rs 2624 Cr	**Estimated Cost: Rs 2680 Cr^**

^Revised cost include net increment cost due to change in conductor configuration from earlier twin HTLS to Quad Moose and reduced line length of 400 kV Wangtoo (HPPTCL) - Panchkula (PG) D/c line after survey to 175 kms ~ Rs 56 Cr

3.3.8 Subsequently, HPPCL vide letter dated 24.08.2023 again informed that the commissioning of July 2025 for Shongtong Karcham would not be feasible to achieve, and the transmission system would be required as per the original schedule of July, 2026.

3.3.9 In the NCT meeting, Member (PS), CEA, informed that the conductor configuration for 400 kV Wangtoo-Panchkula line needs to be further reviewed. After detailed deliberations, the scheme was deferred and it was agreed that a meeting would be convened under Member (Power Systems), CEA, to decide the conductor specification and estimated revised cost of the transmission scheme in a time bound manner.

3.4 **Delinking of Jhatikara - Dwarka 400 kV D/c line (Quad) from the Transmission scheme "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D"**

3.4.1 The transmission scheme "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D" was discussed and recommended in the 5th NCT meeting held on 25.08.2021 and 02.09.2021. MoP vide Gazette Notification dated 06.12.2021 has appointed REC Power Development and Consulting Limited (RECPDCL) as the Bid Process Coordinator of the transmission scheme. The scheme is under bidding.

3.4.2 The scope of the transmission scheme along with the cost estimates (as per the NCT Cost Committee) is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Cost Estimates (as per NCT Cost Committee) (Rs. Cr)
1	Sikar-II – Khetri 765 kV D/c line	• Length – 90 km	548.04
2	Sikar-II – Narela 765 kV D/c line along with 240 MVAr Switchable line reactor for each circuit at each end of Sikar-II – Narela 765 kV D/c line	• Length – 260 km • Switching equipment for 765 kV 240 MVAR Switchable line reactor –4 nos. • 240 MVAr, 765kV Switchable line reactor- 4 nos.	1690.73
3	Jhatikara – Dwarka 400 kV D/c line (Quad)	• Length – 20 km	102.92
4	765 kV line bays at Sikar -II for Sikar-II – Khetri 765 kV D/c line and Sikar-II – Narela 765 kV D/c line	• 765 kV line bays – 4 nos.	92.18
5	2 nos. of 765 kV line bays at both Khetri and Narela S/s	• 765 kV line bays – 4 nos.	92.18
6	2 nos. of 400 kV line bays at both Jhatikara and Dwaraka S/s	• 400 kV line bays – 4 nos.	42.32
Total Cost (Rs Crores)			**2568.37**

Note:

i. Developer of Sikar-II S/s to provide space for 4 nos. of 765 kV line bays at Sikar-II S/s along with space for two nos. of switchable line reactors

ii. Developer of Narela S/s to provide space for 2 nos. of 765 kV line bays along with space for switchable line reactors at Narela S/s

iii. Powergrid to provide space for two nos. of 765 kV line bays at Khetri substation

iv. Powergrid to provide space for two nos. of 400 kV line bays both at Jhatikara and Dwarka S/s.

v. The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.

3.4.3 Due to the high complexity involved in resolution of RoW for the Jhatikara – Dwarka 400 kV transmission line and prior approval required for the proposed transmission line route from various authorities like Delhi Development Authority (DDA), Airport Authority of India Limited (AAI), Flood & Irrigation Department of Delhi; BPC vide letter dated 04.08.2023 has requested to de-link the Jhatikara – Dwarka 400 kV transmission line from the scope of the Phase-III Part D transmission scheme.

3.4.4 Based on the above and in order to avoid further delay in the implementation of the Phase-III Part D transmission scheme, following was proposed for the ease of implementation:

i. Delinking of the 400 kV Jhatikara – Dwarka D/c line (Quad) from the existing scope of Phase-III Part-D transmission scheme
ii. Separate package comprising the 400 kV Jhatikara – Dwarka D/c line (Quad) and its corresponding bays

3.4.5 After detailed deliberations, it was recommended that the delinked scheme i.e. 400 kV Jhatikara – Dwarka D/c line would be awarded under RTM so as to explore some practical and technical solutions for implementation of this scheme. The recommendation of NCT shall have to be sent to MOP for approval as the Phase-III Part-D scheme has been notified to be implemented under TBCB route and the scheme is presently under bidding. The scheme would have to be notified with the revised scope of works.

3.4.6 Detailed scope of the bifurcated scheme is as given below:

a. Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D- Phase I:

- To be implemented through TBCB mode with the **implementation timeframe of 18 months** (from the date of SPV transfer) and with an estimated cost of Rs. 2423.13 Cr.
- The scope of the transmission scheme is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Sikar-II – Khetri 765 kV D/c line	Length – 90 km
2	Sikar-II – Narela 765 kV D/c line along with 240 MVAr Switchable line reactor for each circuit at each end of Sikar-II – Narela 765 kV D/c line	Length – 260 km Switching equipment for 765 kV, 240 MVAR switchable line reactor –4 nos. 765 kV, 240 MVAR Switchable line reactor- 4 nos.
3	765 kV line bays at Sikar -II for Sikar-II – Khetri 765 kV D/c line and Sikar-II – Narela 765 kV D/c line	765 kV line bays – 4 nos.
4	2 nos. of 765 kV line bays at both Khetri and Narela S/s	765 kV line bays – 4 nos.

Note:

i. *Developer of Sikar-II S/s to provide space for 4 nos. of 765 kV line bays at Sikar-II S/s along with space for two nos. of switchable line reactors*
ii. *Developer of Narela S/s to provide space for 2 nos. of 765 kV line bays along with space for switchable line reactors at Narela S/s*
iii. *Powergrid to provide space for two nos. of 765 kV line bays at Khetri substation*
iv. *The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.*

b. Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D- Phase II:

- Separate package including the Jhatikara – Dwarka 400 kV D/c line (Quad) and its corresponding bays, with the **implementation timeframe of 18 months** (from date of allocation) and estimated cost of Rs. 145.24 Cr.
- To be implemented through RTM mode by POWERGRID.
- The scope of the transmission scheme is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Jhatikara – Dwarka 400 kV D/c line (Quad)	Length – 20 km
2	2 Nos. of 400 kV line bays at both Jhatikara and Dwaraka S/s	400 kV line bays – 4 nos.

Note:

i. *POWERGRID to provide space for two nos. of 400 kV line bays both at Jhatikara and Dwarka S/s*
ii. *The line lengths mentioned above are approximate as the exact length shall be obtained after detailed survey.*

3.5 De linking of augmentation of 765/400 kV, 1500 MVA transformer at Bhiwani S/s from Transmission System for evacuation of RE power from renewable energy parks in Leh (5 GW Leh- Kaithal HVDC Transmission corridor)

3.5.1 Transmission system (HVDC+EHVAC) for evacuation of RE power from renewable energy parks in Leh was approved in 7th NCT meeting held on 03.12.2021 (5 GW Leh- Kaithal transmission corridor). The scheme was allocated to POWERGRID in RTM mode vide MOP OM dated 13.01.22 with implementation time frame of 5 years from approval i.e. approval of the Central Government for providing Central Grant for part funding of the project.

3.5.2 As part of EHVAC system (beyond Kaithal) of above scheme, augmentation of 765/400 kV, 1500 MVA transformer at Bhiwani S/s (one section has 2x1000 MVA ICT wherein 1500 MVA augmentation was agreed to be done, whereas other section has 1x1000 MVA ICT & both sections are connected through series reactor) along

with associated bays including 500 MVA spare transformer unit (1- Phase) was also approved.

3.5.3 In 209th OCC meeting of NRPC held on 19.07.23, 'N-1' non-compliance of 765/400 kV Bhiwani (PG) ICTs was deliberated. In the meeting it was brought out that during high solar generation hours, the loading of 765/400 kV, 3x1000 MVA Bhiwani ICTs is observed to be above 'N-1' loading limit. Maximum ICT loading was observed sometimes to be 2300 MW-2500 MW (violated its N-1 loading limit). It was deliberated that augmentation by 1x1500 MVA (4th) transformer at Bhiwani S/s is linked with Transmission system for evacuation of RE power from renewable energy parks in Leh and delay in implementation of the scheme is impacting the implementation of 765/400 kV, 1x1500 MVA (4th) ICT at Bhiwani S/s.

3.5.4 In the operational feedback report of Grid India for the FY 2022-23(Q3/Q4) also, it has been mentioned that during high solar generation hours, the loading of 765/400 kV, 3x1000 MVA Bhiwani ICTs is above 'N-1' loading limit. Therefore, proposal for additional 1500 MVA, 765/400 kV ICT at Bhiwani needs to be expedited.

3.5.5 Grid India agreed to the proposal and stated that the 1500 MVA, 765/400 kV ICT (4th) is required on urgent basis at Bhiwani S/s.

3.5.6 CTUIL informed that as per POWERGRID, Section-I at Bhiwani S/s has 02 Nos. 765/400 kV, 1000 MVA ICTs (ICT-2 and ICT-3) and Section-II has 01 No. 765/400 kV, 1000 MVA ICT (ICT-1). Space is available for 765/400 kV, 1500 MVA ICT (4th) (3rd in Section-I) & 5th (2nd in Section-II), however, space is a constraint for hot spare of 500 MVA unit for both ICT-4 & ICT-5 but same can be installed as cold spare.

3.5.7 In view of the urgent requirement of 1500 MVA, 765/400 kV ICT at Bhiwani S/s, it was agreed that the same would be de-linked from the Transmission system for evacuation of RE power from renewable energy parks in Leh (5 GW Leh-Kaithal Transmission corridor) and would be implemented as a separate scheme. The scheme is recommended to be implemented by POWERGRID under RTM as the entire transmission scheme had been awarded to POWERGRID under RTM route. Further, the recommendation would be sent to MOP for approval, as original scheme was allocated by MoP to POWERGRID.

3.5.8 Summary of the transmission scheme is as under:

Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**
1	Augmentation of 765/400 kV, 1500 MVA transformer at Bhiwani S/s (4th) (3rd in Section-I which have 2x1000 MVA ICTs) along with associated ICT bays	• 765/400 kV, 1500 MVA ICT- 1 No. (3x500 MVA) • 765 kV ICT bay- 1 No. • 400 kV ICT bay- 1 No.
2	500 MVA spare transformer unit (1- Phase) as a cold spare	500 MVA spare transformer unit (1- Phase) – 1 nos.

Estimated Cost: Rs 165 Crores.

Tentative implementation timeframe: 18 months

3.6 **Review of implementation timeline of "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part I" based on TSP request**

3.6.1 In the 9th Meeting of NCT held on 28th September 2022, the Scheme "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part I" was recommended to MoP for implementation under TBCB route with 42 months' schedule from the date of transfer of SPV to the successful bidder. The scheme was notified vide Gazette Notification dated 13th January 2023. The scheme is under bidding by RECPDCL.

3.6.2 Further, the matter regarding change in the implementation timeline of HVDC transmission schemes was discussed in 14th Meeting of NCT held on 09th June 2023. In the meeting, it was agreed that the timeline of commissioning of HVDC shall be increased by 06 months for Bipole-II i.e. if implementation timeline is 48 months for Bipole I, then the timeline would be 54 months for Bipole-II. However, the changed timelines for implementation of HVDC schemes would be applicable only to the new schemes brought up in NCT henceforth.

3.6.3 Subsequently, POWERGRID vide letter dated 09.08.2023 requested to review the execution schedule of the above transmission scheme in terms of increasing the SCOD to 60 months based on the request of OEMs.

3.6.4 Further, POWERGRID vide letter dated 02nd August, 2023 requested for the following:

a) Increase of commissioning schedule from 42 months to 60 months,
b) Increase of time period of bidding from 03 months to 06 months,
c) Request to waive off requirement of Minimum Local Content (MLC) of 60%.

3.6.5 After detailed deliberations, revised commissioning schedule of 48 months for Bipole-I and 54 months for Bipole-2 was recommended by NCT for the "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part I". Since this change in implementation timeline will have implication for evacuation from RE projects, recommendation will have to be sent to MoP in line with MoP order dated 22.03.23.

3.6.6 NCT also opined that the bidding timelines (about 3 months) have been specified in the Standard Bidding Document approved by Ministry of Power and as such the same cannot be changed/modified by the NCT.

3.6.7 It was informed that MoP vide letter dated 05th April, 2023 has already waived off the requirement of MLC of 60%.

3.7 **Modification in implementation schedule of "Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B) in Karnataka" from 36 months to 24 months**

3.7.1 Transmission system for integration of additional RE potential declared by MNRE/SECI for 4 GW each at Koppal and Gadag was recommended for implementation through TBCB route in the 10th NCT meeting held on 07.11.2022. The transmission schemes are under bidding.

3.7.2 The implementation schedule for "Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A) and Gadag-II (Phase-A) in Karnataka" had been kept as 24 months and implementation schedule of "Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B) in Karnataka" had been kept as 36 months, looking into the limited number of applications from RE developers at the time of recommending the transmission schemes.

3.7.3 Subsequently, CTUIL has received large number of connectivity applications from various RE developers during April 2023 to July 2023, seeking connectivity at Koppal-II and Gadag-II pooling stations. Presently, connectivity of about 485 MW at Koppal-II and 830 MW at Gadag-II has been granted/agreed for grant to RE developers. In addition to above, connectivity applications of about 1,669 MW at Koppal-II and 2,420 MW at Gadag-II has been received and are under process. With this, the total connectivity applications at Koppal-II shall be 2,104 MW and at Gadag-II shall be 3,250 MW.

3.7.4 In view of the above, it was proposed to modify the implementation schedule of "Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B) in Karnataka" from 36 months to 24 months for facilitating timely integration of above RE generations. The cost estimates of original scheme had been worked out considering implementation schedule of 18 months, however, due to non-availability of connectivity applications, the implementation schedule was increased to 36 months. With the revision of implementation schedule as 24 months, no changes are expected in the estimated cost of the transmission scheme.

3.7.5 After detailed deliberations, it was agreed to reduce the implementation schedule of Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B) in Karnataka from 36 months to 24 months.

3.7.6 Detailed scope of the scheme is as given below:

A. Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A) and Gadag-II (Phase- A) in Karnataka

Sl.	***Scope of the Transmission Scheme***	***Capacity /km***

Sl.	*Scope of the Transmission Scheme*	*Capacity /km*
1.	Establishment of 765/400kV 2x1500 MVA, 400/220kV 2x500 MVA Koppal-II (Phase-A) Pooling Station with provision of two (2) sections of 4500 MVA each at 400 kV level and provision of four (4) sections of 2500 MVA each at 220 kV level **Future Provisions: Space for (Including space for Phase-B)** • 765/400 kV, 1500 MVA, ICTs – 5 Nos. • 765 kV ICT bays – 5 Nos. • 400 kV ICT bays – 5 Nos. • 400/220 kV, 500 MVA, ICTs – 10 Nos. • 400 kV ICT bays – 10 Nos. • 220 kV ICT bays – 10 Nos. • 765 kV line bays – 8 Nos. (with provision for SLR) • 400 kV line bays – 14 Nos. (with provision for SLR) • 220 kV line bays – 12 Nos. • 220 kV Bus Sectionalizer – 3 sets • 220 kV Bus Coupler (BC) Bay – 3 Nos. • 220 kV Transfer Bus Coupler (TBC) Bay – 3 Nos. • 400 kV Bus Sectionalizer: 1 set	• 765/400 kV, 1500 MVA, ICTs – 2 nos. (7x500 MVA incl. 1 spare unit) • 765 kV ICT bays – 2 nos. • 400 kV ICT bays – 2 nos. • 400/220kV, 500 MVA, ICTs – 2 Nos. • 400 kV ICT bays – 2 Nos. • 220 kV ICT bays – 2 Nos. • 765 kV line bays – 2 Nos. (at Koppal-II for termination of Koppal-II-Narendra new 765kV D/c line) • 220 kV line bays – 4 Nos. • 220 kV Bus Coupler (BC) Bay – 1 No. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 No.
2.	Koppal-II PS – Narendra New 765 kV D/c line with 240 MVAr SLR at Koppal-II PS end (~150 km)	• Line length ~150 km • 765 kV line bays – 2 Nos. (GIS) [at Narendra New] • 765 kV, 240 MVAr SLR at Koppal-II PS – 2 Nos. (7x80 MVAr including 1 switchable spare unit)
3.	2x330 MVAr (765 kV) & 2x125 MVAr (400 kV) bus reactors at Koppal-II PS	• 765kV, 330 MVAr Bus Reactor – 2 Nos. (7x110 MVAr including 1 switchable spare unit for both bus reactor and line reactor) • 765 kV Bus Reactor bays – 2 Nos. • 420kV, 125 MVAr Bus Reactors – 2 Nos. • 420kV, 125 MVAr Bus Reactor bays – 2 Nos.
4.	Establishment of 400/220 kV, 2x500 MVA	• 400/220 kV, 500 MVA ICTs – 2 Nos.

Sl.	*Scope of the Transmission Scheme*	*Capacity /km*
	Gadag-II (Phase-A) Pooling Station **Future Provisions: Space for** • 400/220 kV, 500 MVA, ICTs – 10 Nos. • 400 kV ICT bays – 10 Nos. • 220 kV ICT bays – 10 Nos. • 400 kV line bays – 6 Nos. (with provision for SLR) • 220 kV line bays – 10 Nos. • 220 kV Bus Sectionalizer – 3 sets • 220 kV Bus Coupler (BC) Bay – 3 Nos. • 220 kV Transfer Bus Coupler (TBC) Bay – 3 Nos.	• 400 kV ICT bays – 2 Nos. • 220 kV ICT bays – 2 Nos. • 400 kV line bays – 2 Nos. (at Gadag-II for termination of Gadag-II – Koppal-II line) • 220kV line bays – 4 Nos. • 220 kV Bus Coupler (BC) Bay – 1 No. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 No.
5.	Gadag-II PS – Koppal-II PS 400 kV (Quad Moose) D/c line (~100 km)	• Line length ~100 km • 400 kV line bays - 2 Nos. (at Koppal-II)
6.	2x125MVAr 420kV bus reactors at Gadag-II PS	• 420 kV, 125 MVAr bus reactors – 2 Nos. • 420 kV, 125 MVAr bus reactor bays – 2 Nos.

Note:

(i) Powergrid shall provide space for 2 No. of 765 kV line bays at Narendra (New) for termination of Koppal-II PS – Narendra (New) 765 kV D/c line.

Estimated Cost	**Rs. 2564 cr**
Suggested under	TBCB
Implementation Time Frame	24 Months from date of SPV transfer

B. Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B)

Sl.	*Scope of the Transmission Scheme*	*Capacity /km*
1.	Koppal-II PS – Raichur 765 kV D/c line with 330 MVAr SLR at Koppal-II PS end (~190 km)	• Line length ~190 km • 765 kV line bays – 2 Nos. (at Koppal-II) • 765 kV line bays – 2 Nos. (at Raichur) • 765 kV, 330 MVAr SLR at Koppal-II PS – 2 Nos. (6x110 MVAr) • Switching equipment for 765 kV, 330 MVAr SLR – 2 Nos.
2.	Augmentation by 2x1500 MVA, 765/400 kV, ICTs at Koppal-II PS	• 765/400 kV, 1500 MVA, ICTs – 2 nos. • 765 kV ICT bays – 2 Nos.

Sl.	*Scope of the Transmission Scheme*	*Capacity /km*
		• 400 kV ICT bays – 2 Nos.
3.	Augmentation by 2x500, 400/220 kV, ICTs at Koppal-II PS.	• 400/220 kV, 500 MVA, ICTs – 2 Nos. • 400 kV ICT bays – 2 Nos. • 220 kV ICT bays – 2 Nos. • 220 kV line bays – 4 Nos. • 220 kV Bus Sectionalizer – 1 set • 220 kV Bus Coupler (BC) Bay – 1 No. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 No.

Note:

(i) Powergrid shall provide space for 2 No. of 765 kV line bays at Raichur for termination of Koppal-II PS – Raichur 765 kV D/c line

Estimated Cost	**Rs. 1881 Cr**
Suggested under	TBCB
Implementation Time Frame	24 Months from date of SPV Transfer

3.8 Revision in scope of Spare 80 MVAR Reactor under Rajasthan Ph IV Part C transmission scheme

3.8.1 Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/Barmer Complex): Part A, B, C, D, E, F, H1, H2 was approved in the 14th NCT meeting held on 09.06.2023. CTU has subsequently informed that one No. of 80 MVAR 1-Ph Spare reactor had been considered at Mandsaur S/S under Rajasthan Ph IV Part C transmission scheme. It may be noted that there is no 240 MVAR Reactor bank at Mandsaur S/S under this scheme. 240 MVAR Reactors at Mandsaur S/S have been considered under Rajasthan Ph IV Part D and Rajasthan Ph IV Part H1 scheme.

3.8.2 Since switching scheme is to be formed for spare reactor with the 3-ph reactor bank, it will be better if the 80 MVAR spare reactor may be made part of the scheme comprising of 240 MVAR reactor bank. Thus, 80 MVAR spare reactor may be provided under Rajasthan Ph IV Part D or Rajasthan Ph IV Part H1 scheme in place of Rajasthan Ph IV Part C transmission scheme.

3.8.3 Considering the above, it has been suggested to shift the 80 MVAR spare reactor to Rajasthan Ph IV Part H1 scheme. Further, the spare units have been designated as spare unit for line/Bus Reactor.

3.8.4 After detailed deliberations, NCT approved the shifting of the 80 MVAR spare reactor to Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/Barmer Complex): Part-H1 scheme from Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/Barmer Complex): Part-C scheme.

3.8.5 Detailed scope of the scheme is as under:

Original Scope			**Revised Scope**		
SI No.	**Scope**	**Capacity/Route length**	**SI No.**	**Scope**	**Capacity/Route length**
Part C					
1.	Establishment of 3x1500 MVA, 765/400 kV & 5x500 MVA, 400/220 kV Mandsaur Pooling Station along with 2x330 MVAR (765 kV) Bus Reactors & 2x125 MVAR, 420 kV Bus Reactor Future Provisions: Space for: 765/400 kV ICT along with bays- 3 No. 765 kV line bays along with switchable line reactors – 12 Nos. 765 kV Bus Reactor along with bay: 2 No.	765/400 kV, 1500 MVA ICT – 3 Nos. (10x500 MVA single phase units including one spare unit) 400/220 kV, 500 MVA ICT – 5 Nos. (3 Nos. on 220 kV bus section-1 & 2 Nos. on 220 kV bus section-2) 765 kV ICT bays – 3 Nos. 400 kV ICT bays – 8 Nos. 330 MVAR 765 kV bus reactor-2 Nos. (7x110 MVAR single phase units including one spare unit) 765 kV bus reactor bay- 2 Nos. 765 kV line bay- 2 Nos. (for Indore	1.	Establishment of 3x1500 MVA, 765/400 kV & 5x500 MVA, 400/220 kV Mandsaur Pooling Station along with 2x330 MVAR (765 kV) Bus Reactors & 2x125 MVAR, 420 kV Bus Reactor Future Provisions: Space for: 765/400 kV ICT along with bays- 3 No. 765 kV line bays along with switchable line reactors – 12	765/400 kV, 1500 MVA ICT – 3 Nos. (10x500 MVA single phase units including one spare unit) 400/220 kV, 500 MVA ICT – 5 Nos. (3 Nos. on 220 kV bus section-1 & 2 Nos. on 220 kV bus section-2) 765 kV ICT bays – 3 Nos. 400 kV ICT bays – 8 Nos. 330 MVAR 765 kV bus reactor-2 Nos. (7x110 MVAR single phase units including one spare unit for line/bus reactor) 765 kV bus

	765 kV Sectionaliser bay: 1 -set 400 kV line bays along with switchable line reactor – 12 Nos. 400/220 kV ICT along with bays -5 Nos. 400 kV Bus Reactor along with bay: 2 No. 400 kV Sectionalization bay: 1- set 220 kV line bays: 11 Nos. 220 kV Sectionalization bay: 1 set 220 kV BC and TBC: 1 Nos. STATCOM (± 300 MVAR) along with MSC (2x125 MVAR) & MSR (1x125 MVAR) along with one 400 kV bay.	line) **80 MVAR, 765 kV, 1-ph reactor (spare unit)-1 No.** 125 MVAR, 420 kV bus reactor-2 Nos. 400 kV reactor bay- 2 Nos. 220 kV ICT bays – 5 Nos. 220 kV line bays – 7 Nos. (4 Nos. on bus section-1 and 3 Nos. on bus section-2) 220 kV Bus Sectionaliser – 1 set 220 kV TBC bay – 2 Nos. 220 kV BC bay – 2 Nos.		Nos. 765 kV Bus Reactor along with bay: 2 No. 765 kV Sectionaliser bay: 1 -set 400 kV line bays along with switchable line reactor – 12 Nos. 400/220 kV ICT along with bays -5 Nos. 400 kV Bus Reactor along with bay: 2 No. 400 kV Sectionalization bay: 1- set 220 kV line bays: 11 Nos. 220 kV Sectionalization bay: 1 set 220 kV BC and TBC: 1 Nos. STATCOM (± 300 MVAR) along with MSC (2x125 MVAR) & MSR (1x125 MVAR) along with one 400	reactor bay- 2 Nos. 765 kV line bay- 2 Nos. (for Indore line) ~~**80 MVAR, 765 kV, 1-ph reactor (spare unit)-1 No.**~~ 125 MVAR, 420 kV bus reactor-2 Nos. 400 kV reactor bay- 2 Nos. 220 kV ICT bays – 5 Nos. 220 kV line bays – 7 Nos. (4 Nos. on bus section-1 and 3 Nos. on bus section-2) 220 kV Bus Sectionaliser – 1 set 220 kV TBC bay – 2 Nos. 220 kV BC bay – 2 Nos.

				kV bay.	
Part H1					
2.	240 MVAR switchable line reactors on each ckt at both ends of Mandsaur – Kurawar 765 kV D/c line	240 MVAR, 765 kV switchable line reactor- 4 (2 for Mandsaur end and 2 for Kurawar end) • Switching equipment for 765 kV line reactor- 4 (2 for Mandsaur end and 2 for Kurawar end)	2.	240 MVAR switchable line reactors on each ckt at both ends of Mandsaur – Kurawar 765 kV D/c line	240 MVAR, 765 kV switchable line reactor- 4 (2 for Mandsaur end and 2 for Kurawar end) • Switching equipment for 765 kV line reactor- 4 (2 for Mandsaur end and 2 for Kurawar end) • **80 MVAR, 765 kV, 1-ph reactor (spare unit)-1 No. for Mandsaur end** 80 MVAR, 765 kV, 1-ph reactor (spare unit)-1 No. for Kurawar end is mentioned at Sl. No. 1. of the present scheme.

3.9 **Modifications in the schemes viz. OPGW on 400 kV Agra - Ballabhgarh & 400 kV Kishenpur - Wagoora line approved in 11th NCT**

3.9.1 In 11th NCT meeting held on 28th December, 22 & 17th January, 23, following schemes were inter-alia approved for implementation by POWERGRID under RTM route:

a) OPGW Replacement on 400 kV Agra-Ballabhgarh (Length:181 km)
b) OPGW Replacement on 400 kV Kishenpur- Wagoora line (Length:183 km)

3.9.2 However, POWERGRID informed that above two nos. of OPGW links awarded to POWERGRID for replacement were not originally implemented under ISTS schemes but by PowerTel (PQWERGRID). Further, these links are partially being used in sharing mode for ISTS purpose.

3.9.3 Further, after implementation of the above schemes, the shared usage of the existing PowerTel links for ISTS purpose shall be discontinued and PowerTel usage for the new ISTS OPGW links, if any, shall be governed by CERC norms.

3.9.4 The scheme is proposed to be modified as given below:

Sl. No.	Original Scope	Revised Scope
1.	Replacement of old OPGW and terminal equipment on existing 400 kV Agra – Ballabhgarh line (181 km) with new OPGW and terminal equipment	Supply & Installation of OPGW on 400 kV Agra - Ballabhgarh
2.	Replacement of old OPGW alongwith terminal equipment on 400 kV Kishenpur-Wagoora line with new OPGW (183 km) except LILO portion at New Wanpoh (3 km) and terminal equipment	Supply & Installation of OPGW on 400 kV Kishenpur- Wagoora line

3.9.5 After detailed deliberations, NCT approved the modified scope for implementation by POWERGRID under RTM mode.

4 New Transmission Schemes:

4.1 ISTS Network Expansion scheme "Transmission Scheme for integration of Renewable Energy Zone in Tumkur area of Karnataka"

4.1.1 Out of the identified (86 GW) RE Potential in Southern Region identified as a part of 181.5 GW by MNRE, 17 GW has been identified in the State of Karnataka. A comprehensive transmission system has been identified for immediate integration and evacuation of the above potential. Tumkur REZ is planned to be integrated with existing Tumkur (Pavagada) PS through Tumkur-II PS – Tumkur (Pavagada) 400 kV (Quad ACSR moose) D/c line. Power would be further evacuated through margins in the existing system.

4.1.2 It was informed that the scheme was discussed in the 45th SRPC meeting held on 04.03.2023. SRPC has forwarded the views of Southern Region constituents and communicated that consensus has not arrived for the transmission scheme.

4.1.3 NCT opined that looking into the huge connectivity applications in Koppal & Gadag area in Karnataka wherein even before award of the transmission scheme, the capacities are nearly full. Therefore, new pooling station needs to be opened up in Karnataka for location specific bidding. Further, as connectivity margin is not available in existing Tumkur (Pavagada) pooling station, the new Tumkur-II PS needs to be developed. The proposed transmission system for evacuation of power from Tumkur-II PS is minimal for ensuring immediate connectivity of Tumkur-II PS with existing Tumkur (Pavagada). Further evacuation of power would be through margins in existing system.

4.1.4 After detailed deliberations, the transmission scheme in Tumkur area of Karnataka was recommended to be implemented through TBCB mode with tentative implementation timeframe of 24 months.

4.1.5 Summary of the scheme is given below:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Transmission Scheme for integration of Tumkur-II REZ in Karnataka Tentative Implementation timeframe: 24 months from date of SPV transfer	792.77	Recommended under TBCB.

4.1.6 Detailed Scope of the Scheme is given below:

Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**
1.	Establishment of 400/220 kV 4x500 MVA Pooling Station near Tumkur, Karnataka **Future provisions: Space for** • 400/220 kV, 500 MVA, ICTs – 7 Nos. • 400 kV ICT bays – 7 Nos. • 220 kV ICT bays – 7 Nos. • 400 kV line bays – 6 Nos. (with provision for SLR) • 220 kV line bays – 14 Nos. • 220 kV Sectionalizer: 3 sets • 220 kV Bus Coupler (BC) Bay – 3 Nos. • 220 kV Transfer Bus Coupler (TBC) Bay – 3	• 400/220 kV, 500 MVA, ICTs – 4 Nos. • 400 kV ICT bays – 4 Nos. • 220 kV ICT bays – 4 Nos. • 400 kV line bays – 2 Nos. (at Tumkur-II PS for termination of Tumkur-II – Tumkur(Pavagada) line)) • 220 kV line bays – 4 Nos. • 220 kV Bus Coupler (BC) Bay – 1 No. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 No.

Sl. No.	Scope of the Transmission Scheme	Capacity /km
	Nos.	
2.	Tumkur-II – Tumkur(Pavagada) 400 kV (Quad ACSR moose) D/c line	Route length ~100 km • 400 kV line bays – 2 Nos. (at Tumkur (Pavagada))
3.	2x125 MVAr, 420 kV bus reactors at Tumkur-II PS	• 420 kV, 125 MVAr bus reactors – 2 Nos. • 420 kV, 125 MVAr bus reactor bays – 2 Nos.

Note:

(i) POWERGRID shall provide space for 2 nos. of 400 kV line bays at Tumkur (Pavagada) Pooling station for termination of Tumkur-II – Tumkur (Pavagada) 400 kV (Quad ACSR Moose) D/c line.

(ii) The line length mentioned above is approximate as the exact length shall be obtained after detailed survey.

4.2 **Transmission system strengthening for interconnections of Bhadla-III & Bikaner-III complex**

4.2.1 In order to optimally utilize EHVAC transmission system beyond Bikaner-III PS while providing flexibility of power transfer from Bhadla/Bikaner RE clusters as well as to increase resiliency of transmission corridor in both the complexes i.e. Bhadla & Bikaner, a high capacity tie interconnection between Bhadla-III & Bikaner-III PS was evolved. This would also meet additional evacuation requirement from Bhadla-III PS onwards for some RE generators coming up in the year 2025-26 as well as improves SCR in Bhadla-III complex including for LCC HVDC terminal at Bhadla.

4.2.2 The transmission scheme was discussed and agreed in the 67th NRPC meeting held on 30.06.23.

4.2.3 After detailed deliberations, the transmission scheme for interconnections of Bhadla-III & Bikaner-III complex was recommended to be implemented through TBCB mode with tentative implementation timeframe of 24 months.

4.2.4 Summary of the scheme is given below:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Transmission system strengthening for interconnections of Bhadla-III & Bikaner-III complex. Tentative Implementation	1382	Recommended under TBCB.

	timeframe: 24 months from date of SPV transfer		

4.2.5 Detailed scope of the scheme is given below:

Sl. No.	Scope of the scheme
1.	Bhadla-III – Bikaner-III 765 kV D/c line along with 240 MVAr switchable line reactor for each circuit at Bhadla-III end (line length~150 km)

Note:

i. Developer of Bhadla-III PS to provide space for two nos. of 765 kV line bays along with space for two nos. of switchable line reactors

ii. Developer of Bikaner-III PS to provide space for two nos. of 765 kV line bays

iii. The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.

4.3 Network Expansion scheme in Gujarat for drawl of about 3.6 GW load under Phase-I in Jamnagar area

4.3.1 It was informed that Jam Khambhaliya PS has been planned for 1.5 GW WEZ in Dwarka / Jam Khambhaliya area. Presently, RE connectivity for 416 MW has been granted and another 103 MW is under process. Further, bulk consumers have been granted 800 MW connectivity at Jam Khambhaliya PS and additional applications for 1100 MW have been received from other bulk consumers (RNSEL:50 MW & EET Future: 1050 MW) thereby making total bulk consumer drawal of 1900 MW.

4.3.2 It was further informed that Jam Khambhaliya – Lakadia 400 kV D/c line is a long line which radially caters to RE applicants and bulk consumers at Jam Khambhaliya end. Transfer of power (injection or drawal) more than 1200 MW through this line results into Voltage instability at Jam Khambhaliya end, which limits power transfer capability on the line.

4.3.3 To enhance the transfer capability of this line, strengthen transmission system in Jam Khambhaliya area and to facilitate drawl/injection of power by GETCO as well as by other drawee / RE applicants at Jam Khambhaliya PS, transmission scheme involving establishment of 765/400 kV Jamnagar S/s through LILO of Lakadia – Jam Khambhaliya 400 kV D/c line, Jam Khambhaliya – Jamnagar 400 kV D/c (quad) line, Jamnagar – Halvad 765 kV D/c line etc. was planned in 16th CMETS-WR meeting held on 28.02.2023. The scheme would be able to cater to drawal of upto 3.6 GW load under Phase-I in Jamnagar area of Gujarat [Jamnagar (~750 MW) / Jam Khambhaliya (~2850 MW)].

4.3.4 The transmission scheme was discussed and agreed in 47th WRPC meeting held on 15.06.2023.

4.3.5 After detailed deliberations, the transmission scheme was recommended to be implemented through TBCB mode with tentative implementation timeframe of 24 months.

4.3.6 Summary of the scheme is given below:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	Network Expansion scheme in Gujarat for drawl of about 3.6 GW load under Phase-I in Jamnagar area. Tentative Implementation timeframe: 24 months from date of SPV transfer	3815	Recommended under TBCB.

4.3.7 Detailed scope of the scheme is given below:

Sl. No.	**Scope of the Transmission Scheme**	**Capacity/line length km**
1.	Establishment of 2x1500 MVA 765/400 kV Jamnagar (GIS) PS with 2x330 MVAR 765 kV bus reactor and 2x125 MVAR 420 kV bus reactor. **Future Provisions**: Space for Space for ➢ 765/400 kV ICT along with bays- 4 no. ➢ 765 kV line bays along with switchable line reactors – 10 nos. ➢ 765 kV Bus Reactor along with bay: 2 no. ➢ 765 kV Sectionaliser bay: 1 -set ➢ 400 kV line bays along with switchable line reactor – 8 nos. ➢ 400/220 kV ICT along with bays -6 nos. ➢ 420 kV Bus Reactor along with bay: 2 no. ➢ 400 kV Sectionalization bay: 1- set ➢ 220 kV line bays: 14 nos. ➢ 220 kV Sectionalization bay: 1 set ➢ 220 kV BC: 1 no. ➢ 80MVAR 1-ph spare reactor unit	765/400 kV, 1500 MVA ICT-2 Nos. 765 kV ICT bays- 2 Nos. 400 kV ICT bays- 2 Nos. 330 MVAR 765 kV bus reactor- 2 Nos. 125 MVAR 420 kV bus reactor- 2 Nos. 765 kV reactor bay- 2 Nos. 765 kV line bay- 2 Nos. 400 kV reactor bay- 2 Nos. 400 kV line bay- 10 Nos. 500 MVA, 765/400 kV 1-Ph

Sl. No.	Scope of the Transmission Scheme	Capacity/line length km
		Spare ICT-1 No. 110 MVAR, 765 kV, 1-ph reactor (spare unit for line/bus reactor)-1 No.
2.	Halvad – Jamnagar 765 kV D/c line	Route length: 170 km
3.	2 nos. of 765 kV line bays at Halvad for termination of Halvad – Jamnagar 765 kV D/c line	765 kV line bays– 2 Nos. (for Halvad end)
4.	330 MVAr switchable line reactors on each ckt at Jamnagar end of Halvad – Jamnagar 765 kV D/c line (with NGR bypass arrangement)	• 330 MVAr, 765 kV switchable line reactor- 2 Nos. • Switching equipments for 765 kV line reactor- 2 Nos.
5.	LILO of Jam Khambhaliya PS – Lakadia 400 kV D/c (triple snowbird) line at Jamnagar.	LILO route length: 5 km.
6.	50 MVAr, 420 kV switchable line reactors on each ckt at Jamnagar end of Jamnagar – Lakadia 400kV D/c line (with NGR bypass arrangement)	• 50 MVAr, 420 kV switchable line reactor- 2 Nos. • Switching equipments for 400 kV line reactor- 2 Nos.
7.	Jamnagar – Jam Khambhaliya 400 kV D/c (Quad ACSR/AAAC/AL59 moose equivalent) line	Route Length~ 50 km.
8.	2 nos. of 400kV line bays at Jam Khambhaliya for termination of Jamnagar – Jam Khambhaliya 400kV D/c (Quad ACSR/AAAC/AL59 moose equivalent) line	• 400 kV line bays (GIS) – 2 Nos. (for Jam Khambhaliya end)
9.	LILO of CGPL – Jetpur 400kV D/c (triple snowbird) line at Jamnagar.	LILO route length: 65 km.
10.	80MVAr, 420kV switchable line reactors on each ckt at Jamnagar end of Jamnagar – CGPL 400kV D/c line (with NGR bypass arrangement)	• 80 MVAr, 420 kV switchable line reactor- 2 Nos. • Switching equipments for 400 kV line reactor- 2 Nos.
11.	LILO of both ckts of Kalavad – Bhogat 400kV D/c line (Twin AL-59) at Jam Khambhaliya PS	• LILO route length: 10 km.
12.	4 nos. of 400kV line bays at Jam Khambhaliya for LILO of both ckts of Kalavad – Bhogat 400kV D/c	• 400 kV line bays (GIS) – 4 Nos. (for Jam Khambhaliya

Sl. No.	Scope of the Transmission Scheme	Capacity/line length km
	line	end)
13.	±400 MVAr STATCOM with 3x125 MVAr MSC & 2x125 MVAr MSR at Jamnagar 400kV Bus section	• ±400 MVAr STATCOM (with MSC/MSR) • 400 kV bay – 2 no. (1 no. for STATCOM and 2nd for Dia. completion)*

***** The TSP shall implement one complete diameter (GIS) consisting of 2 main bays & 1 Tie bay in one and half breaker scheme

Note:

(i) Bay(s) required for completion of diameter (GIS) in one-and-half breaker scheme shall also be executed by the TSP.

(ii) TSP (JKTL) shall enable Inter-tripping scheme on Jamnagar – Jam Khambhaliya 400 kV D/c line (for tripping of the 63 MVAR switchable line reactor at Jam Khambhalya PS end along with the main line breaker) after commissioning of the above system.

(iii) TSP of the present scheme shall implement Inter-tripping scheme on Jamnagar – Lakadia 400 kV D/c line (for tripping of the 50MVAR switchable line reactor at Jamnagar end along with the main line breaker) after commissioning of the above system.

(iv) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.

4.4 North Eastern Region Generation Scheme-I (NERGS-I)

4.4.1 Assam Power Distribution Company Limited (APDCL) had applied for ISTS Connectivity under GNA Regulations 2022 for its new solar generation of 1000 MW to be installed in Karbi Anglong, Bokajan, Assam. CTU informed that in-principle grant has been issued to the applicant. The identified augmentation of transmission system for the subject scheme is to be carried out under ISTS.

4.4.2 After detailed deliberations, the transmission scheme North Eastern Region Generation Scheme-I was approved to be implemented through TBCB mode with completion schedule of 31st Dec 2025, matching with Start date of Connectivity of the applicant.

4.4.3 Summary of the scheme is given below:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crores)	Remarks
1.	North Eastern Region Generation Scheme-I (NERGS-	214 crs	Approved under TBCB.

	I) **Completion Schedule:** 31-12-2025		

4.4.4 Detailed scope of the scheme is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity (MVA) / Line length (km)/ Nos.
1.	Establishment of new 400 kV switching station (to be upgraded to 400/220 kV level in future) at Bokajan in Assam **Future Provisions: Space for** - 400/220 kV, 4x500 MVA ICTs along with associated ICT bays at both voltage levels - 420 kV, 2x125 MVAr bus reactor along with associated bays - 9 nos. of 400 kV line bays (along with space for switchable line reactor) for future lines - 10 nos. of 220 kV line bays for future lines - 400 kV bus sectionaliser bay: 1 set - 220 kV bus sectionaliser bay :1 set - 220 kV bus coupler bay: 2 no. - 220 kV transfer bus coupler bay: 2 no.	420 kV, 80 MVAr bus reactor: 2 Nos. 400 kV bus reactor bays: 2 nos. 420 kV, 50 MVAr switchable line reactor: 2 Nos. (one in each circuit of Bokajan – New Mariani 400 kV D/c line formed after LILO of both circuits of Misa (POWERGRID) – New Mariani (POWERGRID) 400 kV D/c line at Bokajan) 400 kV line bays: 5 Nos. *[4 nos. for termination of LILO of both circuits of Misa – New Mariani 400kV D/c line at Bokajan (LILO under this scheme) & 1 no. for termination of APDCL – Bokajan dedicated transmission line (line under scope of M/s APDCL)]*
2.	LILO of both circuits of Misa (POWERGRID) – New Mariani (POWERGRID) 400 kV D/c line at Bokajan	LILO route length 20 km (10 km Loop in and 10 km Loop out)

Note:

(i) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.

4.5 **North Eastern Region Expansion Scheme-XXI Part-B (NERES-XXI Part-B)**

4.5.1 The existing 132 kV Badarpur (POWERGRID) switching station was commissioned in 1999 and shall be completing 25 years in service by 2024. POWERGRID, the owner of the substation has informed that they are facing issues in O&M of the switching station and to improve the reliability it would be prudent to upgrade the switching station from single main and transfer bus scheme to double main transfer bus scheme by converting from AIS to GIS.

4.5.2 The scheme was also discussed in the 23rd TCC & NERPC meetings held on 18th-19th November 2022 wherein the subject upgradation was agreed to be carried out in Green GIS.

4.5.3 Chairperson, CEA, opined that life of sub-stations is generally about 35 years and hence, the reasons for replacement/upgradation of switching station after 25 years needs to be ascertained.

4.5.4 After detailed deliberations, it was decided to review the scheme subsequently.

4.6 **Implementation of Unified Network Management System (UNMS) in the Western Region**

4.6.1 Representative of CTUIL informed that Central Electricity Regulatory Commission (Communication System for inter-State transmission of Electricity) Regulations 2017, mentions that, CTU shall in due consideration of the planning criteria and guidelines formulated by CEA be responsible for planning and coordination for development of reliable National communication backbone for Inter-State Transmission System (ISTS). CEA Technical Standards 2020 calls for centralized monitoring by integrating its network management system with network management system of other users and standalone network elements on regional and national basis. Further, CTUIL shall implement centralized supervision for quick fault detection and restoration.

Accordingly, communication scheme i.e. Establishment of State-of Art Unified Network Management System (U-NMS) for ISTS and State Utility Communication System for all the Regions have been envisaged for five Regional systems and one National system integrating all the regional ones; in main & backup configuration. This will facilitate centralized supervision of ISTS as well as Intra-state communication system at State level, Regional level and Inter-Regional Communication system at national level.

CTUIL updated status for nationwide UNMS Scheme implementation being undertaken by POWERGRID; UNMS for Northern, Eastern and Northeastern Regions are scheduled for commissioning in year 2023/ 2024. And Southern Region scheme approved in 13th NCT meeting in May'23 is under bidding stage.

4.6.2 WRPC has approved implementation of the WR-UNMS project in RTM mode in 47th WRPC meeting held on 14th & 15th June 2023.

4.6.3 Representative of PCD Division, CEA, stated that a workstation console with redundant connectivity would be required under UNMS-WR scheme at WRPC. It was also suggested to include feature for Long, Medium & Short Term Planning for preparing planning projections while including user configurable inputs such as topology, congestion status, utility/ area wise, type of network, product life cycle, sector growth etc. and provision for import of data in .xls or other similar forms for consuming in preparing the planning projection for 2 years, 5 years, 10 years.

4.6.4 It was also discussed that UNMS workstation console with its associated hardware & software along with redundant connectivity is required at all RPC locations for the previously approved regional UNMS Scheme for NER, NR, ER and SR.

4.6.5 Chairman, NCT, started that central planning of the communication network for ISTS and State system shall take the leverage from these Regional & National UNMS having the details of both ISTS and State sector communication network. He also emphasized that National UNMS system should be planned at the earliest to have a holistic view of the network comprising of regional, intra-regional and intra state network and this scheme shall have additional scope of Planning Software tool having features as enlisted by representative of PCD Division.

He also emphasized that SOP for Centralized supervision & Maintenance of ISTS Communication system should be finalized at the earliest while specifying the roles & responsibilities of concerned entities/ agencies for smooth implementation of the hierarchical UNMS Scheme situated in state, regional & national level.

4.6.6 After detailed deliberations, the followings were approved:

- WR UNMS scheme as per agenda along with additional scope listed below to be implemented under RTM mode by POWERGRID.
  a. Inclusion of Workstation Console and associated HW & SW along with redundant communication link & AMC at WRPC location.
  b. Additional feature of Planning Tool

- The National UNMS project proposal to be taken up at the earliest, as all regional systems have been approved for implementation. The national UNMS scheme shall have additional scope of Planning Software tool having features for Long, Medium & Short Term Planning for preparing planning projections while including user configurable inputs such as topology, congestion status, utility/ area wise, type of network, product life cycle, sector growth etc and provision for import of data in .xls or other similar forms for consuming in preparing the planning projection for 2 years, 5 years, 10 years., along with Workstation Console and associated hardware/software with redundant connectivity at PCD Division, CEA.

- Additional scope for Supply, Installation & AMC for UNMS workstation console with its associated hardware & software with redundant connectivity at all four RPC locations for the previously approved regional UNMS Scheme for NER, NR, ER and SR.

4.6.7 Summary of the WR UNMS scheme is as given below:

Sl.No.	Name of the scheme and implementation timeframe	Estimated Cost (Rs. Crores)	Remarks
1.	Establishment of State-of Art Unified Network Management System (U-NMS) for ISTS and State Utility Communication System for Western Region Tentative Implementation timeframe: 24 months from date of allocation	Rs. **84*** Crs. (approx.) and 19.07 Crs. AMC charges for 7 years.	Approved to be implemented under RTM mode by POWERGRID

4.6.8 Detailed scope of the scheme is as given below:

Sl. No.	**Scope of the scheme**	**Estimated Cost (Rs. Crs)**
1.	• Main & Back-up UNMS software and hardware along with required Application software including Video Projection System (VPS), firewall and IDPS. • Remote Workstation for SLDCs. • Video Projection System (VPS), Printer, furniture etc. at main & back-up U-NMS location. • Integration of existing NMS/NEs of ISTS and State Utility in a region in the proposed UNMS. • Integration of upcoming U-NMS for National & other regions and upcoming NMS/NEs of ISTS and State Utility in a region during implementation and AMC period of the project. • Operational support, training & maintenance for proposed UNMS software and hardware. • Auxiliary Power System for U-NMS system. • Workstation Console along and other associated software and hardware such as firewall, router, switch etc. at WRPC, CTUIL HQ and WRLDC location • Bandwidth connectivity & Its recurring charges for WRPC & CTUIL HQ Office.	Rs. **84*** Crs. (approx.) and 19.07 Crs. AMC charges for 7 years.

5 Draft Guidelines on Assessment of Timeframe for Execution of Transmission System

5.1 In the meeting taken by Secretary (Power) on 24th May, 2023, it was decided that CEA shall prepare a guideline to estimate the timeframe for the execution of the transmission system awarded either under Tariff Based Competitive Bidding (TBCB) or under a Regulated Tariff Mechanism (RTM).

5.2 Subsequently, MoP vide letter dated 03.07.2023 has directed that NCT will indicate the tentative implementation timeline of the project in the detailed scope of the project. The timeline will be finalised with the approval of Chairperson, CEA, based on the detailed survey report furnished by the BPCs to CEA and same shall be indicated in the RfP document published by BPCs.

5.3 Accordingly, CEA in consultation with various stakeholders, examined the main factors affecting the implementation timeline of the transmission projects and the reasonable time required for each activity has been finalized.

5.4 These guidelines will be helpful in estimating the time required for the implementation of the transmission projects.

5.5 Chairperson, CEA suggested to take normative timelines for plain area, hilly terrain, etc. according to voltage levels. In case of snowbound area like J&K where the working season is less, timelines can be suitably adjusted. In case of any other constraints like large river crossing, GIB issues, wildlife areas etc. suitable time extension can be given on case to case basis.

5.6 Chairperson, CEA also opined that these timelines will be indicative and NCT will finalise the timeline based on the survey report submitted by BPC.

6 Nomination of Members from RPCs to NCT

6.1.1 SRPC vide letter dated 26.06.2023 mentioned that in the 46th SRPC meeting, the SR States opined that that a member from RPC should be part of NCT. The respective RPC member shall convey the views of RPC /consensus arrived at RPC in respect of the ISTS schemes (being planned) in more coherent manner.

6.1.2 NCT opined that the transmission schemes (above Rs. 500 Crores) are deliberated in the respective RPCs and views of RPC on the Transmission schemes are conveyed to NCT as per the minutes of RPC meeting. While recommending/approving the ISTS schemes, views of concerned RPCs is duly taken into account. Hence, presence of a member from RPC in the NCT meetings in order to again convey their views on the planned ISTS schemes, is not required. Further, NCT has been constituted by MoP and the committee has no mandate to change the constitution.

7 Time Schedule for OPGW installation schemes on existing lines on live line condition

7.1 In 11th NCT meeting, 6 nos. of communication schemes were approved for OPGW installation on existing lines in live line condition. Out of Six schemes, 5 nos. were awarded to POWERGRID in RTM mode and 1 no. to Indigrid in RTM mode. The five nos. scheme awarded to POWERGRID had the implementation schedule varying from 18-24 months.

7.2 The timeframe for implementation of OPGW schemes in live line condition as stated by CTUIL was based on the inputs received from various TSPs. CTU generalised the implementation timeframe for lines less than 200 km as 18 months and for lines greater than 200 km, as 24 months.

7.3 However, POWERGRID after receiving the award letter dtd. 17.02.2023, requested CTU to revise timeframe of OPGW installation from 18/24 months to 36 months vide their letter dtd. 28.03.2023 in view of following constraint being faced by POWERGRID in live line installation:

- Requirement of PTWs (Permit to Work) from Grid-India & difficulties due to power system constraints.

- Limited working window (during dry seasons). Work hampered in rainy season, water logging in fields post rains, in winter seasons due to fog & snow, crop harvesting period etc.

- Limited number of contracting agencies are available after Public Procurement (Preference to Make in India) orders of DOT & MoP. Further, General Financial Rules (Rule 144 (xi) issued by Dept of Expenditure, Ministry of Finance on 23.07.2020) has also impacted supply and installation (Live-Line) of OPGW (03 bidders' only) and Communication Equipment (02 OEMs only).

7.4 It was opined that the complete transmission system is being awarded with implementation timeframe of 24 months and hence, specifying the timeframe of installation of OPGW as 36 months is not justified. Hence, the proposal was not agreed by NCT.

Summary of the deliberations of the 15th meeting of NCT held on 25th August, 2023

I. Modification in the earlier approved/notified transmission schemes:

1. Termination of Bidar – Maheshwaram 765kV D/c line alongwith 240 MVAr switchable line reactor at Maheshwaram end under the "Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka".

Revised scope of the transmission scheme recommended to MoP is given below:

Sl. No.	Revised Scope of the Transmission Scheme	Capacity/km
5.	Establishment of 765/400 kV 3x1500 MVA, 400/220 kV 5x500 MVA pooling station at suitable border location near Bidar with 765 kV (1x240 MVAR) and 400 kV (1x125 MVAR) Bus Reactor **765 kV Future Provision** i) Space for future 765/400 kV ICT along with associated bay: 1 no. ii) Space for future 765 kV Bus Reactor along with associated bay: 1 no. iii) Space for additional future line bays with SLR: 8 nos. iv) Space for additional future 765/400 kV ICT along with associated bay: 2 nos. **400 kV Future Provision** i) Space for future line bay: 8 nos. ii) Space for future 765/400 kV ICT bay: 1 no. iii) Space for future 400/220 kV ICT along with associated bay: 2 nos. iv) Space for additional future line bay with SLR: 2 nos. v) Space for additional future 765/400 kV ICT bay: 2 nos. vi) Space for additional future 400/220 kV ICT along with associated bay: 4 nos. **220 kV Future Provision** i) Space for future 400/220 kV ICT bays: 2 nos. ii) Space for future line bays: 4 nos. iii) Space for additional future 400/220 kV ICT bays: 4 nos. iv) Space for additional future line bay: 6 nos.	765/400 kV, 1500 MVA, ICTs – 3 Nos. (10x500 MVA including 1 spare unit) 500 MVA, 400/220 kV ICT – 5 Nos. 765 kV ICT bays – 3 Nos. 400 kV ICT bays – 8 Nos. 220 kV ICT bays – 5 Nos. 765 kV line bays – 2 Nos. 220 kV line bays – 8 Nos. 765 kV, 240 MVAr Bus reactor – 1 No. (3x80 MVAr) 765 kV Bus reactor bays – 1 No. 125 MVAr, 420 kV Bus reactor – 1 No. 420 kV Bus reactor bay – 1 No. 220 kV Bus sectionalizer– 1set. 220 kV Bus coupler bays – 2 Nos. 220 kV Transfer Bus Coupler bays – 2 Nos.

	v) Space for additional future 220 kV Bus Sectionalizer: 2 sets vi) Space for additional future 220 kV TBC bay: 2 nos. vii) Space for additional future 220 kV BC bay: 2 nos.	
6.	Bidar PS – Maheshwaram (PG) 765 kV D/C line	**Route Length – 242 km**
7.	2 nos. of 765 kV line bays at Maheshwaram (PG) GIS substation for termination of Bidar PS – Maheshwaram (PG) GIS 765 kV D/C line	765 kV line bays (GIS) - 2
8.	765 kV, 1x240 MVAR Switchable Line Reactor for each circuit at Bidar PS end **& Maheshwaram (PG) end** of Bidar PS-Maheshwaram (PG) GIS 765 kV D/C line	240 MVAr, 765 kV line reactor – 4 Nos. [7x80 MVAr at Bidar PS and 7x80 MVAr at Maheshwaram (PG), including 1 spare unit for both Bus Reactor & Line Reactor] Switching equipments for 765 kV reactor – 2 Nos. each at Bidar PS & Maheshwaram.

Note: POWERGRID shall provide space for 2 no. of 765 kV line bays **with provision for 240 MVAr SLR at** Maheshwaram (PG) substation for termination of Bidar PS – Maheshwaram (PG) 765 kV D/c line

2. **Addition of scope of works in OM dated 22.02.2023 to facilitate termination of Bidar – Maheshwaram 765 kV D/c line alongwith 240 MVAr switchable line reactor at Maheshwaram end under the "Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka"**

   Following provision was approved in the detailed scope of works for "Transmission Scheme for evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) /Solar Energy Zone (1500 MW) Part A and Part B" for GIS bay at Maheshwaram for installation of 240 MVAr switchable line reactor by the TSP.

   - Suitable 765 kV GIS module (1 No.) at Maheshwaram end in the GIS diameter under implementation as part of "Transmission Scheme for evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) / Solar Energy Zone (1500 MW) Part A and Part B", to facilitate termination of Bidar – Maheshwaram 765 kV D/c line alongwith 240 MVAr switchable line reactor at Maheshwaram end by TSP for "Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka"

3. **Delinking of Jhatikara - Dwarka 400 kV D/c line (Quad) from the Transmission scheme "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D"**

   Transmission scheme has been bifurcated and following were recommended to MoP:

a) Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D- Phase I:

- To be implemented through TBCB mode with the **implementation timeframe of 18 months** (from the date of SPV transfer) and with an estimated cost of Rs. 2423.13 Cr.
- The scope of the transmission scheme is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Sikar-II – Khetri 765 kV D/c line	Length – 90 km
2	Sikar-II – Narela 765 kV D/c line along with 240 MVAr Switchable line reactor for each circuit at each end of Sikar-II – Narela 765 kV D/c line	Length – 260 km Switching equipment for 765 kV, 240 MVAR switchable line reactor –4 nos. 765 kV, 240 MVAR Switchable line reactor- 4 nos.
3	765 kV line bays at Sikar -II for Sikar-II – Khetri 765 kV D/c line and Sikar-II – Narela 765 kV D/c line	765 kV line bays – 4 nos.
4	2 nos. of 765 kV line bays at both Khetri and Narela S/s	765 kV line bays – 4 nos.

Note:

i. Developer of Sikar-II S/s to provide space for 4 nos. of 765 kV line bays at Sikar-II S/s along with space for two nos. of switchable line reactors

ii. Developer of Narela S/s to provide space for 2 nos. of 765 kV line bays along with space for switchable line reactors at Narela S/s

iii. Powergrid to provide space for two nos. of 765 kV line bays at Khetri substation

iv. The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.

b) Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D- Phase II:

- Separate package including the Jhatikara – Dwarka 400 kV D/c line (Quad) and its corresponding bays, with the **implementation timeframe of 18 months** (from date of allocation) and estimated cost of Rs. 145.24 Cr.
- To be implemented through RTM mode by POWERGRID.
- The scope of the transmission scheme is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Jhatikara – Dwarka 400 kV D/c line (Quad)	Length – 20 km
2	2 Nos. of 400 kV line bays at both Jhatikara and Dwaraka S/s	400 kV line bays – 4 nos.

Note:

i. *Powergrid to provide space for two nos. of 400 kV line bays both at Jhatikara and Dwarka S/s*

ii. *The line lengths mentioned above are approximate as the exact length shall be obtained after detailed survey.*

4. De Linking of augmentation of 765/400 kV, 1500 MVA transformer at Bhiwani S/s from Transmission system for evacuation of RE power from renewable energy parks in Leh (5 GW Leh- Kaithal HVDC Transmission corridor)

De-linking of the following scope from the Transmission system for evacuation of RE power from renewable energy parks in Leh (5 GW Leh-Kaithal Transmission corridor) and recommended to MoP to be implemented by POWERGRID under RTM:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1	Augmentation of 765/400 kV, 1500 MVA transformer at Bhiwani S/s (4^{th}) (3^{rd} in Section-I which have 2x1000 MVA ICTs) along with associated ICT bays	• 765/400 kV, 1500 MVA ICT- 1 No. (3x500MVA) • 765 kV ICT bay- 1 No. • 400 kV ICT bay- 1 No.
2	500 MVA spare transformer unit (1- Phase) as a cold spare	500 MVA spare transformer unit (1- Phase) – 1nos.

Estimated Cost: Rs 165 Crores.

Tentative implementation timeframe: 18 months

5. Review of implementation timeline of "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part I" based on TSP request

Revised commissioning schedule of 48 months for Bipole-I and 54 months for Bipole-2 was recommended by NCT for the "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part I".

6. Modification in implementation schedule of "Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B) in Karnataka" from 36 months to 24 months

Implementation schedule of Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B) in Karnataka has been agreed to be reduced from 36 months to 24 months.

7. Revision in scope of Spare 80 MVAR Reactor under Rajasthan Ph IV Part C transmission scheme

NCT approved the shifting of the 80 MVAR spare reactor to Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/Barmer Complex): Part-H1 scheme from Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/Barmer Complex): Part-C scheme.

Original Scope			Revised Scope		
SI No.	**Scope**	**Capacity/Route length**	**SI No.**	**Scope**	**Capacity/Route length**
Part C					
1.	Establishment of 3x1500 MVA, 765/400 kV & 5x500 MVA, 400/220 kV Mandsaur Pooling Station along with 2x330 MVAR (765 kV) Bus Reactors & 2x125 MVAR, 420 kV Bus Reactor Future Provisions: Space for: 765/400 kV ICT along with bays- 3 No. 765 kV line bays along with switchable line reactors – 12 Nos. 765 kV Bus Reactor along with bay: 2 No. 765 kV Sectionaliser bay: 1 -set 400 kV line bays along with	765/400 kV, 1500 MVA ICT – 3 Nos. (10x500 MVA single phase units including one spare unit) 400/220 kV, 500 MVA ICT – 5 Nos. (3 Nos. on 220 kV bus section-1 & 2 Nos. on 220 kV bus section-2) 765 kV ICT bays – 3 Nos. 400 kV ICT bays – 8 Nos. 330 MVAR 765 kV bus reactor-2 Nos. (7x110 MVAR single phase units including one spare unit) 765 kV bus reactor bay- 2 Nos. 765 kV line bay- 2 Nos. (for Indore line) **80 MVAR, 765 kV, 1-ph reactor (spare unit)-1 No.** 125 MVAR, 420	1.	Establishment of 3x1500 MVA, 765/400 kV & 5x500 MVA, 400/220 kV Mandsaur Pooling Station along with 2x330 MVAR (765 kV) Bus Reactors & 2x125 MVAR, 420 kV Bus Reactor Future Provisions: Space for: 765/400 kV ICT along with bays- 3 No. 765 kV line bays along with switchable line reactors – 12 Nos. 765 kV Bus Reactor along with bay: 2 No. 765 kV	765/400 kV, 1500 MVA ICT – 3 Nos. (10x500 MVA single phase units including one spare unit) 400/220 kV, 500 MVA ICT – 5 Nos. (3 Nos. on 220 kV bus section-1 & 2 Nos. on 220 kV bus section-2) 765 kV ICT bays – 3 Nos. 400 kV ICT bays – 8 Nos. 330 MVAR 765 kV bus reactor-2 Nos. (7x110 MVAR single phase units including one spare unit for line/bus reactor) 765 kV bus reactor bay- 2 Nos. 765 kV line bay- 2 Nos. (for Indore line)

	switchable line reactor – 12 Nos. 400/220 kV ICT along with bays -5 Nos. 400 kV Bus Reactor along with bay: 2 No. 400 kV Sectionalization bay: 1- set 220 kV line bays: 11 Nos. 220 kV Sectionalization bay: 1 set 220 kV BC and TBC: 1 Nos. STATCOM (± 300 MVAR) along with MSC (2x125 MVAR) & MSR (1x125 MVAR) along with one 400 kV bay.	kV bus reactor-2 Nos. 400 kV reactor bay- 2 Nos. 220 kV ICT bays – 5 Nos. 220 kV line bays – 7 Nos. (4 Nos. on bus section-1 and 3 Nos. on bus section-2) 220 kV Bus Sectionaliser – 1 set 220 kV TBC bay – 2 Nos. 220 kV BC bay – 2 Nos.		Sectionaliser bay: 1 -set 400 kV line bays along with switchable line reactor – 12 Nos. 400/220 kV ICT along with bays -5 Nos. 400 kV Bus Reactor along with bay: 2 No. 400 kV Sectionalization bay: 1- set 220 kV line bays: 11 Nos. 220 kV Sectionalization bay: 1 set 220 kV BC and TBC: 1 Nos. STATCOM (± 300 MVAR) along with MSC (2x125 MVAR) & MSR (1x125 MVAR) along with one 400 kV bay.	~~**80 MVAR, 765 kV, 1-ph reactor (spare unit) 1 No.**~~ 125 MVAR, 420 kV bus reactor-2 Nos. 400 kV reactor bay- 2 Nos. 220 kV ICT bays – 5 Nos. 220 kV line bays – 7 Nos. (4 Nos. on bus section-1 and 3 Nos. on bus section-2) 220 kV Bus Sectionaliser – 1 set 220 kV TBC bay – 2 Nos. 220 kV BC bay – 2 Nos.
Part H1					
2.	240 MVAR switchable line reactors on each ckt at both ends of	240 MVAR, 765 kV switchable line reactor- 4 (2 for Mandsaur end and	2.	240 MVAR switchable line reactors on each ckt at both	240 MVAR, 765 kV switchable line reactor- 4 (2 for

	Mandsaur – Kurawar 765 kV D/c line	2 for Kurawar end) • Switching equipment for 765 kV line reactor- 4 (2 for Mandsaur end and 2 for Kurawar end)		ends of Mandsaur – Kurawar 765 kV D/c line	Mandsaur end and 2 for Kurawar end) • Switching equipment for 765 kV line reactor- 4 (2 for Mandsaur end and 2 for Kurawar end) • **80 MVAR, 765 kV, 1-ph reactor (spare unit)-1 No. for Mandsaur end** 80 MVAR, 765 kV, 1-ph reactor (spare unit)-1 No. for Kurawar end is mentioned at Sl. No. 1. of the present scheme.

8. Modifications in the schemes viz. OPGW on 400kV Agra - Ballabhgarh & 400kV Kishenpur - Wagoora line approved in 11th NCT

NCT approved the modified scope for implementation by POWERGRID under RTM mode:

SI No.	Original Scope	Revised Scope
1.	Replacement of old OPGW and terminal equipment on existing 400 kV Agra – Ballabhgarh line (181 km) with new OPGW and terminal equipment	Supply & Installation of OPGW on 400 kV Agra - Ballabhgarh
2.	Replacement of old OPGW alongwith terminal equipment on 400 kV	Supply & Installation of OPGW on 400 kV Kishenpur- Wagoora

	Kishenpur-Wagoora line with new OPGW (183 km) except LILO portion at New Wanpoh (3 km) and terminal equipment	line

II. ISTS Transmission schemes, costing between Rs 100 Crore to Rs 500 Crore, approved by NCT:

(a) The transmission schemes approved by NCT under TBCB route is given below:

Sl. No.	Name of Transmission Scheme	Implementation Mode	Tentative Implementation timeframe	Allocated to	Estimated Cost (Rs. Crs)
1.	North Eastern Region Generation Scheme-I (NERGS-I)	TBCB	Completion Schedule: 31.12.2025	RECPDCL	214

The broad scope of above ISTS scheme, approved by NCT for implementation through TBCB route to be notified in Gazette of India is as given below:

Sl. No.	Name of Scheme & Implementation timeframe	Broad Scope	Bid Process Coordinator

1.	North Eastern Region Generation Scheme-I (NERGS-I)	i. Establishment of new 400 kV switching station (to be upgraded to 400/220 kV level in future) at Bokajan in Assam including 1 no. of 400 kV line bay for termination of APDCL – Bokajan 400kV S/c dedicated transmission line ii. LILO of both circuits of Misa (POWERGRID) – New Mariani (POWERGRID) 400 kV D/c line at Bokajan switching station along with 420 kV, 50 MVAr switchable line reactor (one in each circuit) in Bokajan – New Mariani 400 kV D/c line at Bokajan formed after above LILO **(Detailed scope as approved by 15th NCT and subsequent amendments thereof)**	RECPDCL

III. ISTS Transmission schemes, costing greater than Rs 500 Crore recommended by NCT to MoP:

(a) The ISTS transmission schemes recommended by NCT to MoP are given below:

Sl. No.	Transmission Scheme	Implementation Mode	Tentative Implementation timeframe	BPC	Estimated Cost (Rs. Crs)
1	Transmission Scheme for integration of Tumkur-II REZ in Karnataka	TBCB	24 Months	RECPDCL	792.77
2	Transmission system strengthening for interconnections of Bhadla-III & Bikaner-III complex.	TBCB	24 Months	PFCCL	1382
3	Network Expansion scheme in Gujarat for drawl of about	TBCB	24 Months	PFCCL	3815

	3.6 GW load under Phase-I in Jamnagar area.				

The broad scope of ISTS schemes, recommended by NCT to MoP for implementation through TBCB mode, to be notified in Gazette of India is as given below:

Sl. No.	Name of Scheme & Implementation timeframe	Broad Scope	Bid Process Coordinator
1.	Transmission Scheme for integration of Tumkur-II REZ in Karnataka Tentative Implementation timeframe: 24 months from SPV transfer	i. Establishment of 400/220 kV 4x500 MVA Pooling Station near Tumkur, Karnataka ii. Tumkur-II – Tumkur (Pavagada) 400 kV (Quad ACSR moose) D/c line iii. 2x125 MVAr 420 kV bus reactors at Tumkur-II PS **(Detailed scope as approved by 15th NCT and subsequent amendments thereof)**	RECPDCL
2.	Transmission system strengthening for interconnections of Bhadla-III & Bikaner-III complex Tentative Implementation timeframe: 24 months from SPV transfer	• 765 kV Bhadla-III – Bikaner-III D/c line along with 240 MVAr switchable line reactor for each circuit at Bhadla-III end (~150 km) **(Detailed scope as approved by 15th NCT and subsequent amendments thereof)**	PFCCL
3.	Network Expansion scheme in Gujarat for drawl of about 3.6 GW load under phase-I in Jamnagar area	i. Establishment of 2x1500 MVA 765/400 kV Jamnagar (GIS) with 2x330 MVAR 765 kV bus reactor	PFCCL

	Tentative Implementation timeframe: 24 months from SPV transfer	and 2x125 MVAR 420 kV bus reactor. ii. Halvad – Jamnagar 765kV D/c line iii. 2 nos. of 765 kV line bays at Halvad for termination of Halvad – Jamnagar 765kV D/c line iv. 330 MVAr switchable line reactors on each ckt at Jamnagar end of Halvad – Jamnagar 765kV D/c line (with NGR bypass arrangement) v. LILO of Jam Khambhaliya PS – Lakadia 400kV D/c (triple snowbird) line at Jamnagar with conductor having ampacity equivalent to triple snowbird at nominal voltage vi. 50MVAr, 420kV switchable line reactors on each ckt at Jamnagar end of Jamnagar – Lakadia 400kV D/c line (with NGR bypass arrangement) vii. Jamnagar – Jam Khambhaliya 400kV D/c (Quad ACSR/AAAC/AL59 moose equivalent) line viii. 2 nos. of 400kV	

		line bays at Jam Khambhaliya for termination of Jamnagar – Jam Khambhaliya 400kV D/c (Quad ACSR/AAAC/AL59 moose equivalent) line ix. LILO of CGPL – Jetpur 400kV D/c (triple snowbird) line at Jamnagar with conductor having ampacity equivalent to triple snowbird at nominal voltage x. 80 MVAr, 420 kV switchable line reactors on each ckt at Jamnagar end of Jamnagar – CGPL 400 kV D/c line (with NGR bypass arrangement) xi. LILO of both ckts of Kalavad – Bhogat 400 kV D/c line (Twin AL-59) at Jam Khambhaliya PS with Twin AL59 Moose equivalent conductor xii. 4 nos. of 400 kV line bays at Jam Khambhaliya for LILO of both ckts of Kalavad – Bhogat 400kV D/c line xiii. ±400MVAr STATCOM with	

		3x125 MVAr MSC & 2x125 MVAr MSR at Jamnagar 400kV Bus section **(Detailed scope as approved by 15th NCT and subsequent amendments thereof)**	

IV. ISTS communication schemes approved by NCT for implementation under RTM Route:

Sl. No.	Name of Transmission Scheme	Implementation Mode	Implementation timeframe	Implementing Agency	Estimated Cost (Rs Cr)
1.	Implementation of Unified Network Management System (UNMS) in the Western Region	RTM	24 months	POWER GRID	84+19.07 = 103.07

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Annex-I

List of Participants of the 15th meeting of NCT

CEA:

1. Sh. Ghanshyam Prasad, Chairperson, CEA and Chairman, NCT
2. Sh. A. K. Rajput, Member (Power Systems)
3. Sh. Rakesh Goyal, Chief Engineer (PSPA-II)
4. Sh. Ishan Sharan, Chief Engineer (PSPA-I)
5. Sh. Ajay Talegaonkar, Chief Engineer (PSPM)
6. Sh. S.K Maharana, Chief Engineer (PCD)
7. Sh. Deepanshu Rastogi, Deputy Director (PSPA-II)
8. Sh. Pranay Garg, Deputy Director (PSPA-II)
9. Sh. Prateek Shrivastava, Assistant Director (PCD)
10. Sh. Prateek Jadaun, Assistant Director (PSPA-II)
11. Sh. Manish Kr. Verma, Assistant Director (PSPA-II)

MNRE:

1. Sh. Dayanand Kumar, Deputy Manager
2. Sh. Koushik Goswami, DGM
3. Sh. Tarun Singh, Scientist D

SECI:

1. Sh. Kaustuv Roy, GM

CTUIL:

1. Sh. Ashok Pal, Deputy COO
2. Sh. Jasbir Singh, CGM
3. Sh. Sourov Chakraborty, CGM
4. Sh. Rajesh Kumar, Sr GM
5. Sh. KK Sarkar, Sr GM
6. Ms. Nutan Mishra, Sr GM
7. Sh. P.S Das, Sr GM
8. Sh. Anil Kumar Meena, GM
9. Sh. Kashish Bhambhani, GM
10. Ms. Sangita Sarkar, Chief Manager
11. Sh. Pratyush Singh, Chief Manager
12. Sh. Manish Ranjan Keshari, Chief Manager

GRID India:

1. Sh. S.R Narasimhan, CMD
2. Sh. Rajiv Porwal, Director (SO)
3. Sh. Surajit Banerjee, CGM
4. Sh. Rahul Shukla, CM
5. Sh. Vivek Pandey, GM
6. Sh. Raj Kishan, AM

NITI Aayog

1. Sh. Manoj Kumar Upadhyay, Deputy Advisor

RECPDCL

1. Sh. P.S. Hariharan, CGM (Transmission)
2. Sh. Amit Chatterjee, Executive(Technical)

Expert Member:

1. Ms. Seema Gupta
2. Sh. Ravinder Gupta

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