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 उन्नीसवीं बैठक की कार्यसूची – के सम्बन्ध में ।

Subject: Agenda for the 19th Meeting of National Committee on Transmission (NCT) – regarding.

महोदया **(Madam)** / महोदय **(Sir),**

The 19th meeting of the "National Committee on Transmission" (NCT) is scheduled as given below:

Date: 29th April, 2024

Time: 04:00 PM

Venue: Chintan, 2nd Floor, CEA, Sewa Bhawan, R.K. Puram Sector-1, New Delhi

The agenda for the meeting is enclosed herewith. Kindly make it convenient to attend the meeting.

भवदीय/Yours faithfully

22.04.2024

(बी.एस.बैरवा / B.S. Bairwa)
मुख्य अभियन्ता (इंचार्ज) एवं सदस्य सचिव,एन.सी.टी.
/Chief Engineer (I/C) & 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 Systems), 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. Lalit Bohra, Joint Secretary Room no 602, 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.	Sh. Ravinder Gupta Ex. Chief Engineer CEA		

Special Invitee

Chief Engineer (PCD), CEA

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Agenda for the 19th meeting of National Committee on Transmission

1 Confirmation of the minutes of the 18th meeting of National Committee on Transmission.

1.1 The minutes of the 18th meeting of NCT held on 05.03.2024 were issued vide CEA letter no CEA-PS-12-13/3/2019-PSPA-II dated 11.03.2024.

1.2 Observations were received on minutes from CTUIL. Corrigendum to the minutes was issued vide letter dated 15.03.2024

1.3 CTUIL further submitted following amendments to the minutes:

1.3.1 In table below 4.1.5 (A) REZ Ph-IV (Part 3: 6GW) (Bikaner Complex) :Part A(Estimated Cost: Rs 5968.5 Cr), following may be mentioned as note:

"POWERGRID shall provide space for 2 nos. of 400 kV line bays at Fatehabad (PG). Indi Grid shall provide space for 2 nos. of 400 kV line bays (GIS) at Patran (Indi Grid) S/s"

1.3.2 In table below 4.1.5 (B) REZ Ph-IV (Part 3: 6GW) (Bikaner Complex) :Part B (Estimated Cost: Rs 5357.36 Cr), following may be mentioned as note:

"POWERGRID shall provide space for 2 nos. of 400 kV line bays each at Jind (PG) & Sonipat (PG) S/s"

1.4 Members may confirm the minutes, along with the corrigendum and proposed notes at para 1.3.1 and 1.3.2 above.

2 Status of the transmission schemes noted/approved/recommended to MoP in the 18th meeting of NCT:

2.1 Status of new transmission schemes approved/recommended:

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	BPC	Award/ Gazette notification
1.	Transmission system for evacuation of power from Rajasthan REZ Ph IV (Part 3: 6GW) (Bikaner Complex): Part A	Recommended	TBCB	RECPDCL	Gazette Notified by MoP dated 14.03.2024
2.	Transmission system for evacuation of power from Rajasthan	Recommended	TBCB	RECPDCL	Gazette Notified by MoP dated

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	BPC	Award/ Gazette notification
	REZ Ph IV (Part 3: 6GW) (Bikaner Complex): Part B				14.03.2024
3.	Transmission Scheme for integration of Davanagere / Chitradurga and Bellary REZ in Karnataka	Recommended	TBCB	PFCCL	Gazette Notified by MoP dated 14.03.2024
4.	Transmission Scheme for integration of Bijapur REZ in Karnataka	Recommended	TBCB	PFCCL	Gazette Notified by MoP dated 14.03.2024
5.	Transmission System under ISTS for evacuation of power from Kudankulam Unit - 3 & 4 (2x1000 MW)	Recommended	TBCB	PFCCL	Gazette Notified by MoP dated 14.03.2024
6.	Augmentation of 2x500 MVA, 400/230 kV transformation capacity (3rd & 4th ICTs) at Karur PS	Approved	RTM	Not applicable	Informed to CTUIL vide letter dated 11.03.2024
7.	Augmentation of transformation capacity at Jam Khambhaliya PS (GIS)	Approved	TBCB	PFCCL	Gazette Notified by CEA dated 01.04.2024
8.	Transmission Scheme for integration of Tumkur-II REZ in Karnataka	Approved	TBCB	RECPDCL	Gazette Notified by CEA dated 01.04.2024
9.	Additional FOTE for redundancy at AGC locations in ER	Approved	RTM	Not applicable	Informed to CTUIL vide letter dated 11.03.2024
10.	OPGW laying work on 400kV BokaroA-Kodarma line	Approved	RTM	Not applicable	Informed to CTUIL vide letter dated 11.03.2024

2.2 *Status of transmission schemes where modifications was suggested:*

S. No.	Scheme where modifications was suggested	Status
1.	Modification in scope of work of Eastern Region Expansion Scheme-XXXIX (ERES-XXXIX)	Informed to BPCs vide letter dated 11.03.2024
2.	Modification in SCOD of "Transmission System for Evacuation of Power from REZ in Rajasthan (20 GW) under Phase-III Part-G"	Informed to CTUIL vide letter dated 11.03.2024
3.	Modification in SCOD of Transmission scheme for evacuation of 4.5 GW RE injection at Khavda PS under Phase II Part A	Informed to CTUIL vide letter dated 11.03.2024

3 Modifications in the earlier approved/notified transmission schemes

3.1 **Implementation of Jhatikra- Dwarka 400 kV (Quad) D/c line under Rajasthan REZ Ph-III, Part-D- Ph-II Scheme:**

"Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase-III Part D" was recommended in the 5th NCT meeting held on 25/08/2021 and 02/09/2021 to be implemented through TBCB mode. MoP vide Gazette Notification dated 06/12/2021 has appointed RECPDCL as the Bid Process Coordinator of the subject transmission scheme, who has issued LOI on 29/12/2023 to POWERGRID.

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 DDA, Airport Authority of India Limited (AAI), Flood & Irrigation Department of Delhi etc., BPC vide letter dated 04/08/2023 requested to de-link the Jhatikara – Dwarka 400 kV transmission line from the scope of the Phase-III Part D transmission scheme. Accordingly, the matter was discussed in the 15th NCT meeting held on 25/08/2023 and it was recommended that 400 kV Jhatikara – Dwarka D/c line (Quad) would be Delinked from the existing scope of Phase-III Part-D transmission scheme (with new name as Phase-III, Part-D-Phase-II) and awarded under RTM as Rajasthan REZ Phase-III, Part-D-Phase-II.

Accordingly, MoP vide their OM dated 06/11/2023 had allocated 400 kV Jhatikra- Dwarka (Quad) D/c line (Under Rajasthan REZ Phase-III- Part-D) to POWERGRID for implementation under RTM with Implementation schedule as 18 months from the date of allocation of the project.

Subsequently, POWERGRID vide letter dated 29/12/2023 has informed that after immediate walkover survey, they have gathered that in view of severe ROW in Dwarka (Delhi) area, implementation of this line (on lattice tower with narrow base) is very difficult/not possible with quad conductor. In the detailed survey report submitted by POWERGRID, the subject line has to pass through various difficult/dense locations where Monopole structure towers are

envisaged. Further, recently, LILO of Bamnauli-Jhatikara 400 kV line at Narela S/s has been implemented by POWERGRID on monopole with Twin HTLS conductor. In addition to this, regarding execution of transmission line in Delhi Area, approvals are to be obtained from various Statutory bodies like Airport Authority of India, DDA, DMRC, NGT, and many more, which requires substantial time.

In view of above, POWERGRID requested to revise the conductor configuration of 400 kV Jhatikra- Dwarka D/c line from Quad conductor to Twin HTLS conductor (on monopole). Further, in view of various approvals to construct the line in Delhi area, implementation schedule of the line is also requested to be revised from 18 months to 24 months. As per route survey report, taking into account the proposed changes, cost estimate was indicated as about Rs. 258 Crores (approx.).

The proposal was deliberated in the 17th NCT meeting held on 31.01.24 in which NCT directed CTUIL to re-survey of the scheme through implementing agency so as to arrive at the optimum requirement of monopole/narrow base tower towers, and work out the revised estimated cost.

Accordingly, a joint site visit of representatives from CEA, CTUIL, POWERGRID and RECPDCL was done on 28.02.2024 for preliminary assessment of the requirement of monopole/narrow base towers. As per the report submitted by the team, the findings were as under :

- It was concluded that prima facie, it appears that there is RoW issue in many places in the portion of line from Dwarka S/s upto Urban Extension Road - II (UER-II), however, at few locations narrow base tower / normal type towers could be installed subject to the approval of DDA, meeting RoW requirement. In the remaining portion of the line, from UER-II upto Jhatikara S/s, it seems that most of the line goes through the Agricultural land and narrow base tower / normal type towers could be installed subject to the approval of DDA.
- It was also concluded that a detailed proposal regarding the actual number of normal lattice towers/ monopoles/ narrow based towers to be considered for implementation of line along with the cost estimation may be prepared by CTUIL in consultation with POWERGRID.

Further, POWERGRID, member of the site visit committee, has subsequently provided the following comments to CEA on joint site report vide email dated 12.03.2024 on the conclusion as under:

i. *There is RoW issues in most of the places in the portion of line from Dwarka s/s up to Urban Extension Road-II (UER-II), due to which monopole structure may be installed. In remaining portion of line, from UER-II to Jhatikara s/s, it seems that most of the line passes through the agricultural land, where normal type/ narrow base tower may be installed subject to approval of DDA.*

ii. *During site visit, POWERGRID stated that due to very less available space along the Najafgarh Drain, Monopole with Twin HTLS is feasible solution for stretch from Dwarka s/ s up to UER-II due to design limitation of Monopole. From UER-II to Jhatikara s/s, line may be possible on Quad Moose conductor. However, as line length is approximately 17 Kms, therefore, for ease of implementation & operation, POWERGRID proposed Twin HTLS for complete Dwarka-Jhatikara TL.*

Considering above, the indicative cost has been estimated by CTUIL based on following input and using NCT cost matrix (price level Mar'2023) as well as LOA of 400 kV Atuar (WUPPTCL)-Indirapuram (WUPPTCL) D/C Line (TBCB) [Total cost 58.72 crores and line length 10.209 km with combination of monopole & narrow base lattice tower @ Rs. 5.75 Cr/km].

- Total length of line: 17 kms (Approx. 7 km on Monopole & 10 km on Narrow base)
- Conductor Configuration: Twin HTLS
- Tower: Monopole/ Narrow base lattice tower
- Line passing through forest: 7 km
- Substation bays: 02 no. AIS line bays at Jhatikara and 02 nos. GIS bays at Dwarka

Cost estimated based on the above is about Rs 240.08 Cr.

Members may deliberate.

4 New Transmission Schemes:

4.1 **Transmission system strengthening to facilitate evacuation of power from Bhadla/ Bikaner complex**

4.1.1 **Detailed scope of the scheme is given below:**

S. No.	Items	Details
1.	**Name of Scheme**	Transmission system strengthening to facilitate evacuation of power from Bhadla/Bikaner complex
2.	**Scope of the scheme**	Transmission system strengthening to facilitate evacuation of power from Bhadla/Bikaner complex ➢ 400 kV Bareilly(765/400kV) – Bareilly (PG) D/c line (Quad) (2nd) (~4 km) ➢ Augmentation with 1x1500 MVA, 765/400 kV ICT (3rd) at Bareilly (765/400kV) S/s
3.	**Depiction of the scheme on Transmission Grid Map**	Given in the figure below
4.	**Upstream/downstream system associated with the scheme**	400kV Bareilly (PG) & 765/400 kV Bareilly (PG) are existing substation. 400 kV Bareilly (PG) S/s have 400 kV interconnection with Rampur (UPPTCL), Bareilly (765/400kV) (PG), Lucknow (UPPTCL), Shahjahanpur (PG), Bareilly (UPPTCL), Meerut (PG) & Moradabad (UPPTCL) at 400kV level. 765/400 kV Bareilly (PG) S/s have 765 kV interconnection with Lucknow (PG) and 400 kV interconnection with Bareilly (PG), Kashipur (PTCUL) & Jauljivi (PG).
5.	**Objective /**	1. The present scheme comprises Transmission system

S. No.	Items	Details
	Justification	strengthening to facilitate evacuation of power from Bhadla/Bikaner complex. 2. In 27th CMETS-NR meeting held on 10/01/2024, It was deliberated that comprehensive Transmission scheme for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex) is under implementation for power transfer of 7.7 GW including 4 GW from Bikaner-III PS. The scheme comprises 765kV EHVAC corridor from Bikaner-III PS towards load centers of Delhi/UP. As part of the above scheme, 765 kV Bikaner-III -Neemrana 2xD/c and Neemrana-II – Bareilly (PG) D/c lines are being implemented. 3. Further, as part of Rajasthan REZ Ph-III (20GW) Transmission scheme, Bhadla-III & Ramgarh PS are being established for integration of 6.5GW & 2.9 GW RE potential respectively. Ramgarh PS is also being inter-connected with Bhadla-III for evacuation of RE power. In order to facilitate evacuation of 9.4GW RE power from Ramgarh/Bhadla-III PS (6.5 GW+2.9 GW) from Bhadla-III onwards, 765 kV Bhadla-III - Sikar-II D/c line with implementation schedule of March'25 [for about 2.9 GW power transfer requirement] as well as 6 GW HVDC corridor (±800 kV Bhadla (HVDC) -Fatehpur (HVDC)) with implementation schedule of Apr'28 (Pole-1) & Oct'28 (Pole-2) is being implemented as part of Ph-III scheme. Accordingly, in 19th CMETS-NR meeting, 765kV Bhadla-III - Bikaner-III D/c line was agreed to meet evacuation requirement from Bhadla-III PS onwards for some RE generators coming up in 2025-26 as well as Optimal utilization of EHVAC transmission system beyond Bikaner-III PS while providing flexibility of power transfer from Bhadla/Bikaner RE clusters. The scheme is under bidding. 4. To facilitate above evacuation of power as well as to meet N-1 criteria (beyond 765kV Bareilly S/s), additional 400 kV corridor i.e. 400kV Bareilly(765/400kV) – Bareilly(PG) D/c line (Quad) (2nd) along with augmentation with 1x1500 MVA, 765/400 kV ICT at Bareilly (765/400kV) S/s (3rd) is proposed. The above strengthening scheme is also included as part of connectivity system of various RE applications granted at Bikaner-III. 5. CEA agreed for the proposal, however they enquired

S. No.	Items	Details
		about short circuit level of 400 kV Bareilly (765/400 kV) & Bareilly(PG) S/s. CTU stated that short circuit level of 400 kV Bareilly (765/400 kV) is about 52 kA (designed capacity:50 kA) & 400 kV Bareilly (PG) S/s is about 51 kA (designed capacity: 40 kA), however with above proposed scheme short circuit level increase marginally (1-2 kA) on both the substations. CTU stated that to reduce short circuit level of various substation in NR, wherein short circuit level is already high (from designed capacity), measures will be taken as part of comprehensive scheme in a phased manner. Grid India stated that scheme is agreeable. 6. In 27th CMETS-NR meeting It was stated that POWERGRID vide mail 21.01.23 confirmed the space availability for 765/400kV ICT (3rd) at Bareilly (PG) (765/400kV) as well as 2 nos. of 400kV line bays each at Bareilly (PG) (765/400kV) and Bareilly (PG) (400kV). 7. Considering grant of connectivity to new RE generators in Bikaner/Bhadla complex as well as for evacuation of power beyond Bikaner/Bhadla complex, transmission scheme was agreed (as per S.No.2) in 27th CMETS-NR meeting for evacuation of power from Bhadla/Bikaner complex
6.	**Estimated Cost**	**Rs. 198.75 Cr.**
7.	**Impact on the total Annual Transmission charges in % along with the existing ATC**	A. ATC (considering Levelized Tariff @15% of estimated cost): Rs 29.8125 Cr. B. Present ATC: Rs. ₹46024.95 Cr.* C. A/B (%): 0.06477 %
8.	**Need of phasing, if any**	Not Applicable
9.	**Implementation timeframe**	18 months from allocation of project
10.	**Inclusion of any wild life/protected area along the transmission line route**	Line lengths were reviewed in Gati Shakti portal w.r.t. any wildlife/protected area, airport along the transmission line route (Gati Shakti Map is enclosed below) No major National Parks (NP), Wild Life Sanctuary (WLS), other protected areas observed. However, for its finalization details of other forest/protected areas etc., survey is required to be done.
11.	**Deliberations with RPC along with their comments**	NA

S. No.	Items	Details
12.	**System Study for evolution of the proposal**	Studies discussed and agreed in following meeting • 27th CMETS-NR meeting held on 10.01.24

***Total YTC allowed for Dec'23, as per notification of transmission charges payable by DICs for Billing Month of February 2024 dated 25.01.2024 published on NLDC website (available at https://posoco.in/transmissionpricing/notification-of-transmission-charges-for-the-dics/)*

4.1.2 Detailed scope of the scheme is given below:

Transmission system strengthening to facilitate evacuation of power from Bhadla/Bikaner complex

Sl. No.	Scope of the Transmission Scheme	Item Description
1.	400 kV Bareilly(765/400kV) – Bareilly(PG) D/c line (Quad) (2nd)	Line length : 4 kms • 400 kV line bays -2 nos.(at Bareilly(765/400kV) S/s • 400 kV line bays - 2 nos. (at Bareilly(PG) S/s)
2.	Augmentation with 1x1500 MVA, 765/400 kV ICT (3rd) at Bareilly (765/400kV) S/s	• 765/400 kV, 1500 MVA ICT - 1 no. • 765 kV ICT bay - 1 no. • 400 kV ICT bay - 1 no.

Note:

- *The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey*
- *POWERGRID to provide space for 2 nos. of 400kV line bays each at Bareilly(765/400kV) & 400kV Bareilly(PG) S/s*
- *POWERGRID to provide space for 1500 MVA ICT at Bareilly (765/400kV) along with its associated bays.*

4.1.3 Schematic of the above scheme is given below:

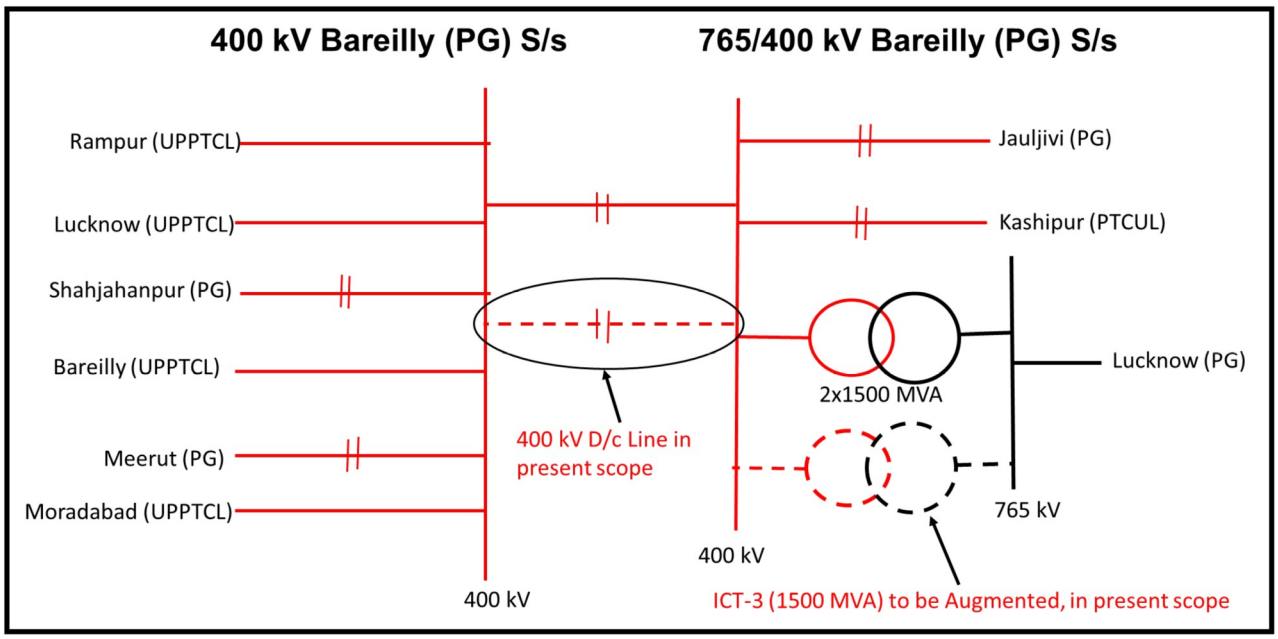
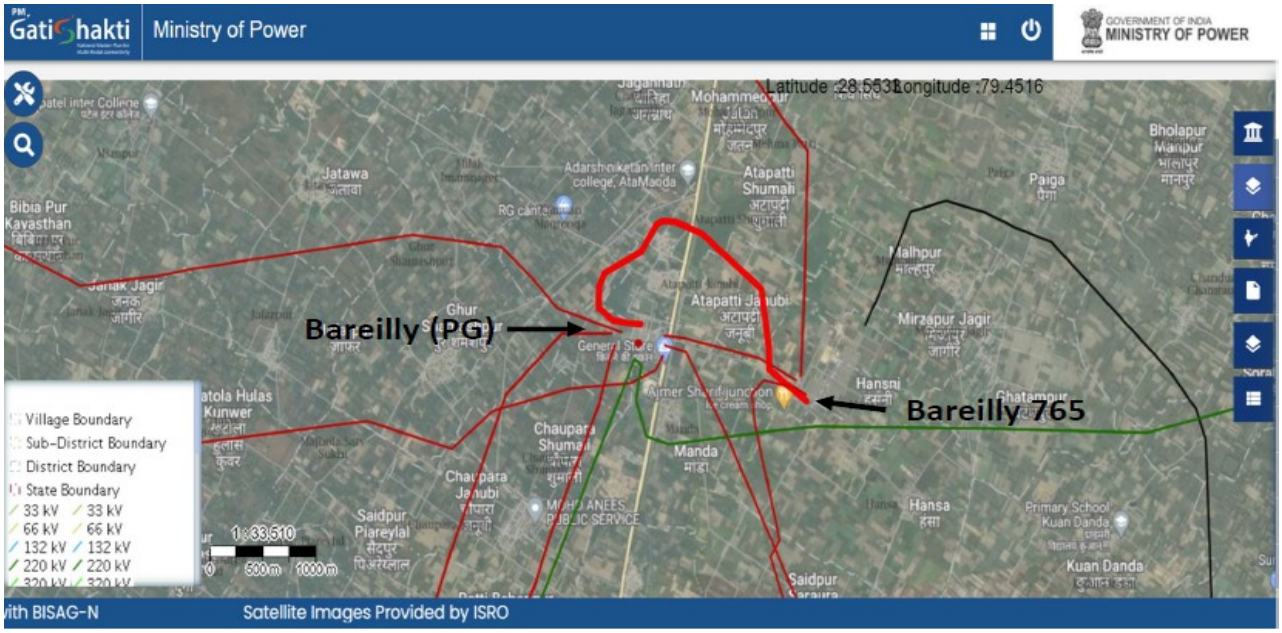


Fig: Transmission system strengthening to facilitate evacuation of power from Bhadla/Bikaner complex



4.1.4 Members may deliberate.

4.2 Transmission system for evacuation of power from Fatehgarh/Barmer Complex as part of Rajasthan REZ Ph-IV (Part-4 :3.5 GW) [Fatehgarh/Barmer Complex]

Sl. No.	Items	Details
1.	Name of Scheme	Transmission system for evacuation of power from Fatehgarh/Barmer Complex as part of Rajasthan REZ Ph-IV (Part-4 :3.5GW)
2.	Scope of the	**Transmission system for evacuation of power from Rajasthan REZ Ph-**

Sl. No.	Items	Details
	scheme	**IV (Part-4 :3.5 GW) [Fatehgarh/Barmer] Complex** **Fatehgarh-IV: 1 GW (Solar), Barmer-I :2.5GW (Solar)** ➢ Establishment of 765/400 kV, 2x1500 MVA S/s at suitable location near Merta (Merta-II Substation) along with 2x125 MVAr & 2x240 MVAr bus reactor at Merta-II* S/s **Future Provisions: Space for** • 765/400 kV ICTs along with bays- 4 • 765 kV line bays along with switchable line reactors – 8 • 765 kV Bus Reactor along with bay: 1 nos. • 400 kV line bays along with switchable line reactor –8 • 400 kV line bays – 2 nos. • 400 kV Bus Reactor along with bays: 1 no. • 400kV Sectionalizer bay: 2 sets • 400/220kV ICT along with bays -6 nos. • 220 kV line bays for RE injection -8 nos. • 220kV Sectionalizer bay: 2 set • 220 kV BC (3 nos.) bays and 220 kV TBC (3 nos.) bays • 6000 MW, ±800 kV Merta (HVDC) [LCC] terminal station (4x1500 MW) along with bays • STATCOM (2x±300MVAr, 4x125MVAr MSC, 2x125MVAr MSR) along with 400kV bays (2 nos.) ***along with provision of 80 MVAr & 110 MVAr spare reactors (Single phase) & 500 MVA spare transformer unit (Single phase)*** ➢ STATCOM (2x±300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr) along with 2 nos. 400kV bays at Barmer-I PS ➢ Augmentation with 765/400 kV, 2x1500 MVA Transformer (4th & 5th) at Barmer-I PS ➢ Augmentation of 5x500 MVA (5^{th} to 9^{th}), 400/220 kV ICTs at Barmer-I PS ➢ 220 kV line bays (6 nos.) for RE connectivity at Barmer-I PS ➢ 220 kV Sectionalizer bay (1 set) along with 220 kV BC (1 nos.) bay and 220 kV TBC (1 nos.) bay at Barmer-I PS ➢ 400 kV Sectionalizer bay (1 set) at Barmer-I S/s ➢ 110MVAr spare reactor unit (1 no.) at Barmer-I PS (single phase) ➢ Fatehgarh-IV PS (Sec-2) – Barmer-I PS 400kV D/c line (Quad) (~45km) ➢ Barmer-I PS – Merta-II 765 kV D/c line along with 330MVAr switchable line reactor for each circuit at each end of Barmer-I PS

Sl. No.	Items	Details
		– Merta-II 765 kV D/c line (~345 km) ➢ Merta-II – Beawar 400 kV D/c line (Quad) (~55 km) ➢ Merta-II – Dausa 765 kV D/c line along with 240 MVAr switchable line reactor for each circuit at each end of Merta-II – Dausa 765 kV D/c line line (~250 km) ➢ Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Ghiror (Distt. Mainpuri) along with 2x125 MVAr & 2x240 MVAr bus reactor at Ghiror S/s (UP) **Future provisions at Ghiror S/s (excl. scope for present scheme): Space for** • 765/400kV ICTs along with bays- 4 • 765 kV line bays along with switchable line reactors – 6 • 765kV Bus Reactor along with bay: 1 nos. • 400 kV line bays along with switchable line reactor –6 • 400 kV Bus Reactor along with bays: 1 no. • 400kV Sectionalizer bay: 1 set • 400/220kV ICT along with bays -4 nos. • 220 kV line bays for drawl -6 nos. • 220kV Sectionalizer bay: 1 set • 220 kV BC (2 nos.) bay and 220 kV TBC (2 nos.) bay • STATCOM (2x+300MVAr, 4x125MVAr MSC, 2x125MVAr MSR) along with 400kV bays (2 nos.) ***along with provision of 80 MVAr & 110 MVAr spare reactor (Single phase) & 500MVA spare transformer unit (Single phase)*** ➢ Dausa - Ghiror 765 kV D/c line along with 330MVAr switchable line reactor at Ghiror end and 240 MVAr switchable line reactor at Dausa end for each circuit of Dausa - Ghiror 765 kV D/c line (~305 km) ➢ LILO of both ckt of 765 kV Aligarh (PG) -Orai (PG) D/c line (~15 km) at Ghiror S/s along with 240 MVAr switchable line reactor for each circuit at Ghiror end of 765 kV Ghiror -Orai(PG) D/c line ➢ LILO of one ckt of 765kV Agra (PG) – Fatehpur(PG) 2xS/c line at Ghiror S/s along with 240 MVAr switchable line reactor at Ghiror end of 765 kV Ghiror -Fatehpur(PG) line (~30 kms) ➢ 400kV Ghiror-Firozabad (UPPTCL) D/c line (Quad) (~50 kms)
3.	Depiction of the scheme on Transmission Grid Map	Given below
4.	Upstream/ downstream system associated with the scheme	765/400/220 kV Fatehgarh-IV PS (Sec-2) and Barmer-I PS are under bidding as part of Rajasthan REZ Ph-IV (Part-2 :5.5GW) scheme. 765/400/220kV Fatehgarh-IV PS(Sec-2) is being interconnected to Sirohi S/s (Under bidding), Beawar S/s (Under implementation) and Fatehgarh-III PS

Sl. No.	Items	Details
		(Sec-2) (Under Implementation) at 765kV level and Bhinmal(PG) at 400kV level. 765/400/220kV Barmer-I PS is being interconnected to Sirohi S/s (Under bidding) at 765kV level and Fatehgarh-III PS (Sec-2) at 400kV level. 765/400KV Dausa S/s is under implementation as part of Rajasthan REZ Ph-III (20 GW) by Beawar-Dausa Transmission Ltd. (POWERGRID) is being interconnected to Beawar S/s, Gwalior(PG), Jaipur(RVPN) through 765kV lines and Agra(PG) & Jaipur(South) through 400 kV lines 765/400kV Aligarh (PG), Orai (PG), Agra (PG) & Fatehpur (PG) are existing ISTS substation of POWERGRID. 765kV Orai(PG) S/s is interconnected with Aligarh, Jabalapur, Satna & Gwalior S/s at 765kV level and Orai (UPPTCL) at 400 kV level. 765 kV Aligarh S/s is interconnected with Orai (PG), Agra(PG), Gr. Noida(UP), Kanpur(PG), Jhatikara(PG) at 765kV level and Prithala (GPTL) at 400kV level. 765/400/220 kV Fatehpur(PG) is interconnected with Agra(PG), Varanasi (PG) at 765 kV level and Allahabad (PG), Kanpur(PG), Mainpuri(PG), Singrauli (NTPC), Unchahar (NBPPL) at 400 kV level 765/400/220 kV Agra(PG) is interconnected with Fatehpur(PG), Jhatikara (PG), Aligarh at 765 kV level and Agra (UP), Agra(Fatehabad-UP), Ballabgarh (PG), Bhiwadi (PG), Bassi(PG), Jaipur (South), Sikar(PG), Auraiya (NTPC), Kanpur (PG) at 400 kV level. Agra (PG) is interconnected with Biswanath Charialli/Alipurduar through HVDC(±800 kV) lines
5.	Objective / Justification	8. The present scheme comprises Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-4 :3.5GW) from Fatehgarh/Barmer complex (Fatehgarh-IV: 1 GW, Barmer-I PS: 2.5GW) 9. Joint Study Meeting(s) were held in virtual mode on 28.12.23 and 09.01.24 with SECI, CEA, GRID-INDIA, RVPN, HVPN, PSTCL, UPPTCL and other STUs of Northern region to deliberate & finalize the Transmission system for evacuation of power from Fatehgarh/Barmer Complex as part of Rajasthan REZ Ph-IV (Part-4:3.5GW) scheme. Gist of discussion in 1st Joint study meeting held on 28.12.23 10. It was informed that Transmission scheme for Rajasthan REZ Ph-IV (Part-2:5.5GW) (Jaisalmer/Barmer Complex) was approved in 14th NCT meeting for injection at Fatehgarh-IV PS (4GW) & Barmer-I PS (1.5GW) in Rajasthan and under bidding. 11. At present connectivity of about 9 GW is already granted/received at Fatehgarh-IV(5GW) and Barmer-I PS(4GW). Studies were carried out corresponding to 2026-27 time frame in solar maximized scenario for EHV AC system and study files for solar maximized scenario was shared on 20.12.23 with all constituents. 12. It was stated in meeting that the power evacuation system comprises

<table>
<tr><th>Sl. No.</th><th>Items</th><th>Details</th></tr>
<tr><td></td><td></td><td>
3.5 GW capacity EHV AC system from Fatehgarh-IV/Barmer-I (thus makes total planned capacity of 9 GW (5.5 GW+3.5 GW)). Details of RE potential considered in Fatehgarh/Barmer complex is as under:
<table>
<tr><th>S.No</th><th>Transmission Scheme</th><th>RE Potential</th><th>Cumulative Potential</th></tr>
<tr><td>1</td><td>Rajasthan REZ Ph-IV
(Part-2:5.5GW) (Jaisalmer/Barmer Complex)
EHVAC system - Under Bidding</td><td>5.5GW (Solar)
Fatehgarh-IV: 4 GW
Barmer-I: 1.5 GW</td><td>5.5 GW (Solar)
Fatehgarh-IV:4 GW
Barmer-I: 1.5 GW</td></tr>
<tr><td>2</td><td>Rajasthan REZ Ph-IV
(Part-4:3.5GW) (Jaisalmer/Barmer Complex)
EHV AC system-Present proposal</td><td>3.5 GW (Solar)
Fatehgarh-IV: 1 GW
Barmer-I: 2.5 GW</td><td>9 GW (Solar)
Fatehgarh-IV: 5 GW
Barmer-I: 4 GW</td></tr>
</table>
13. In the Joint study meeting held on 28.12.2023, following broad transmission system for evacuation of power from Fatehgarh/Barmer Complex as part of Rajasthan REZ Ph-IV (Part-4 :3.5GW) was proposed
Fatehgarh-IV: 1 GW (Solar), Barmer-I :2.5GW (Solar)
➢ Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Merta (Merta-II Substation)
➢ STATCOM (2x±300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr) at Barmer-I PS
➢ Fatehgarh-IV PS (Sec 2)– Barmer-I PS 400kV D/c line (Quad)
➢ Barmer-I PS – Merta-II 765 kV D/c line
➢ Merta-II – Beawar 400 kV D/c line (Quad)
➢ Merta-II – Dausa 765 kV D/c line
➢ Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Ghiror (Distt. Mainpuri)
➢ Dausa - Ghiror 765 kV D/c line
➢ LILO of both ckt of 765 kV Aligarh (PG) -Orai (PG) D/c line at Ghiror S/s
➢ LILO of one ckt of 765 kV Agra (PG) – Fatehpur(PG) 765kV D/c line at Ghiror
14. In above meeting, Grid-India enquired about installation of STATCOMs at new pooling stations in Bikaner and Fatehgarh/Barmer complex. CTU stated that at present 3 nos. STATCOMs are already operational at Fatehgarh-II, Bhadla-II & Bikaner-II and 2 nos.
</td></tr>
</table>

Sl. No.	Items	Details
		STATCOMs at Ramgarh and Fatehgarh-III are under implementation. Additionally, 3 nos. STATCOMs at Bikaner-IV, Siwani and Barmer-I is also planned in proposed schemes (Ph-IV: Part 3 & 4). Additionally, space provision to be kept STATCOM at Merta-II, & Ghiror S/s as part of future scope. 15. Grid-India stated that proposal is in order, however 400/220 kV ICTs (2x315MVA) at Agra (PG) is critically loaded in N-1 contingency. CTU stated that with proposed scheme there is marginally increment (~5MW) in 400/220kV ICT loading in Agra. CTU stated that space is not available for installation of 3rd ICT at Agra(PG) S/s, therefore replacement of ICTs may be considered in future based on real time loadings. 16. CTU stated that in the present proposal, 765kV Aligarh-Orai and Fatehpur -Agra high capacity corridors are optimally utilized as the loadings of lines are lesser in solar maximized scenario. 765/400kV Orai Substation is well connected with WR Grid and Power from 765/400kV Orai shall be dispersed to load centres of WR through various high capacity lines. CTU requested UPPTCL to provide space availability for 2 nos. of 400 kV line bays at Firozabad S/s for Ghiror-Firozabad D/c line. This will also relieve the loading of Agra ICTs and increase resiliency of system. UPPTCL agreed for the same. 17. UPPTCL requested that studies may be performed with Bhadla-Fatehpur HVDC system to check loadings with proposed system. CTU stated that Bhadla-Fatehpur system is under bidding with scheduled implementation Feb'28 (Pole-1) and therefore not considered in studies, however they will carry out sensitivity case considering HVDC system and commensurate RE generation and will provide to UPPTCL. Same was provided to UPPTCL on 02.01.24. 18. CEA stated that proposal in order however, studies may be reviewed with UP's intra state transmission system and associated RE generation in GEC-II. CTU agreed for the same. CTU enquired SECI and UPPTCL for envisaged RE potential in Bundelkhand region. UPPTCL stated that UPNEDA communicated 10GW RE potential in Bundelkhand region (UP). It was requested that UPPTCL may provide communication to CEA/CTU in 2-3 days, so same can be forwarded to SECI for evaluation of developable RE potential in this region. UPPTCL agreed for the same. 19. Further, UPPTCL informed in the meeting that space is available for 2 nos. of 400kV line bays at Firozabad S/s however, they shall confirm the same after verification. Prima facie loading of 400kV Ghiror- Firozabad D/c line is in order. 20. Revised study files with proposed changes (considering 400 kV Ghiror-Firozabad D/c line & Barmer-I STATCOM as part of proposed scheme) and considering UP intra state solar generation and associated transmission scheme (GEC-II) was circulated on 06.01.24 along with

Sl. No.	Items	Details
		study plots. Gist of discussion in Joint study meeting held on 09.01.24 21. CTU stated that in Joint study meeting held on 28.12.23, Transmission system for evacuation of power from Fatehgarh/Barmer Complex as part of Rajasthan REZ Ph-IV (Part-4 :3.5GW) was in-principally agreed. Further, some observations were received on 04.01.24 from Grid-India on studies. 22. Grid-India stated that the surplus power in NR and WR during solar peak period is flowing towards ER and high loading is observed in 765 kV Ranchi - Dharamjaygarh line and other EHV lines towards ER with higher angular separation after N-1. Due to high loading, low voltages observed in ER region on various EHVAC buses. 23. CTU stated that based on Grid-India observations, in revised studies, Gazuwaka HVDC is already reversed (1000 MW) towards ER and Talcher-Kolar capacity is also kept minimum in forward direction (600-700MW). This will relieve loading of various WR-ER corridors incl. 765kV Ranchi – Dharamjaygarh D/c up to a certain extent. 24. CTU stated the loading of some of WR-ER corridors are in general high and with proposed scheme (Rajasthan Ph-IV (Part-4 :3.5 GW)), there is marginal increment on above Inter regional links in winter solar maximized scenario. In the next phase of studies (2028-29) with proposed HVDC corridors from NR to ER and NR to WR, loadings will be reviewed, and measures will be taken up if required. Grid-India & CEA agreed for the same 25. CTU enquired about RE potential at Ghiror complex for provision of 220kV scope at Ghiror S/s. SECI replied that solar irradiation level at Ghiror complex is less and at present they are not anticipating RE applications for injection at Ghiror. In view of that it was decided that 220kV future scope shall not be considered at Ghiror for RE injection. 26. UPPTCL informed that space is available at 400kV Firozabad S/s for interconnection of proposed 400kV Ghiror – Firozabad D/c line and power flow is in order on the above line. CTU requested UPPTCL to provide the above information in the mail at the earliest. Regarding RE potential in Bundelkhand region, UPPTCL stated that they have received inputs from UPNEDA however UPPTCL sought some clarifications as well as some additional inputs from UPNEDA. CTU requested UPPTCL to provide the same at the earliest. 27. Further CTU enquired for drawl requirement at Merta-II and Ghiror S/s. UPPTCL stated that in view of growing load of UP, space provision may be kept for future drawl requirement at Ghiror S/s, however they will confirm the same on mail. RVPN stated that they will revert with the drawl requirement at Mera-II S/s. No other comments received from any

Sl. No.	Items	Details
		Stakeholders. Revised study files incorporating stakeholder comments on all India LGB, study files were already circulated on 06.01.24 along with study plots. 28. Off peak file were circulated on 13.01.24 to all stakeholders and based on voltages specially in Ghiror complex, reactive compensation was reviewed & incorporated. Result of system studies incorporating observations received from stakeholders is enclosed. 29. Further the proposal was deliberated in 27th CMETS-NR meeting held on 10.01,24. In the meeting RVPN stated that they do not have any drawl requirement in future from proposed Merta-2 S/s, however as informed earlier in joint study meeting, in view of envisaged RE potential in Nagaur distt., space provision to be kept for 220kV scope i.e. 400/220kV ICTs., 220 kV line bays for drawl & 220kV Sectionalization bay for RE injection. 30. Subsequently, line lengths of some of the transmission lines were modified w.r.t new location of Barmer-I PS as well as review in Gati Shakti portal. Accordingly in view of high voltages in off solar hours, reactive compensation of some of the lines was agreed in 28th CMETS-NR meeting held on 27.03.24 and 49th TCC/72nd NRPC meeting held on 29th -30th Mar'24. Further in the above meetings, it was agreed that LILO of one ckt of 765kV Agra (PG) – Fatehpur(PG) 765kV D/c line at Ghiror along with 240 MVAr switchable line reactor at Ghiror S/s end of 765 kV Ghiror -Fatehpur line shall be considered as LILO of one ckt of 765kV Agra (PG) – Fatehpur(PG) 2xS/c line (in view of 2xS/c line configuration) at Ghiror along with 240 MVAr switchable line reactor at Ghiror S/s end of 765 kV Ghiror -Fatehpur line 31. Considering grant of connectivity to RE generators in Fatehgarh/Barmer complex as well as for evacuation of power beyond above complex, transmission scheme (as per S.No.2) was agreed in Joint study meetings (28.12.23 & 09.01.24) as well as in 27th CMETS-NR meeting held on 10.01.24 for evacuation of power from Fatehgarh/Barmer Complex as part of Rajasthan REZ Ph-IV (Part-4 :3.5GW). The scheme shall also facilitate evacuation of additional power evacuation from Nagaur complex (2GW) for which some immediate transmission system requirement from Nagaur complex and inter regional corridors requirement shall be assessed
6.	Estimated Cost	**Rs. 12,105.22 Cr.**
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	D. ATC (considering Levelized Tariff @15% of estimated cost): Rs 1815.783 Cr. E. Present ATC: Rs. ₹46024.95 Cr.* F. A/B (%): 3.945 %

Sl. No.	Items	Details
8.	Need of phasing, if any	Not Applicable
9.	Implementation timeframe	24 months from allocation of project
10.	Inclusion of any wild life/protected area along the transmission line route	Line lengths were reviewed in Gati Shakti portal w.r.t. any wildlife/protected area, airport along the transmission line route (Gati Shakti Map is enclosed in Annexure-II). Details of wild life/protected area protected areas observed on bee line of transmission line under the scheme is attached in Annexure-III. However, for details of other forest/protected areas survey is required to be done.
11.	Deliberations with RPC along with their comments	The transmission scheme was discussed and technically approved in the 71st NRPC meeting held on 29.01.24 and recommended to NCT. Further, reactive compensation of some of the lines was modified and same was approved in 49th TCC/72nd NRPC meeting held on 29th-30th Mar'24. In the meeting it was also agreed that OPGW installation on 765kV Agra (PG) – Fatehpur (PG) D/c line (335 kms.) may be considered as a separate scheme with implementation schedule of 24 months (preferably matching timeframe with Ph-IV (Part-4 :3.5GW) scheme)

**Total YTC allowed for Dec'23, as per notification of transmission charges payable by DICs for Billing Month of February 2024 dated 25.01.2024 published on NLDC website (available at https://posoco.in/transmissionpricing/notification-of-transmission-charges-for-the-dics/)*

Detailed scope of the scheme is given below:

4.2.1 Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-4 :3.5 GW): Part A

Estimated Cost: Rs 5,845.93 Cr

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
1	Augmentation with 765/400 kV, 2x1500 MVA Transformer (4th & 5th) at Barmer-I PS	• 765/400 kV 1500 MVA ICTs- 2 nos. • 765 kV ICT bays-2 no. • 400 kV ICT bays- 2 no.
2	Augmentation of 5x500 MVA (5th to 9th), 400/220 kV ICTs at Barmer-I PS	• 400/220 kV 500 MVA ICTs- 5 nos. • 400 kV ICT bays-5 nos. • 220 kV ICT bays- 5 nos.
3	220kV line bays (6 nos.) for RE connectivity at Barmer-I PS	• 220 kV line bays- 6 nos.
4	400kV Sectionalizer bay (1 set), 220kV Sectionalizer bay (1 set) along with 220kV BC (1 nos.) and 220 kV TBC (1 nos.) at Barmer-I PS	• 400 kV Sectionalier bay: 1 set • 220 kV Sectionalizer bay: 1 set • 220 kV BC (1 nos.) bay and 220 kV TBC (1 nos.) bay

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
5	STATCOM (2x±300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr) along with 2 nos. 400 kV bays at Barmer-I PS	• STATCOM (2x±300MVAr) MSC (4x125 MVAr) & MSR (2x125 MVAr) • 400kV bays at Barmer-I PS – 2 nos.
6	Fatehgarh-IV PS (Sec-2) – Barmer-I PS 400kV D/c line (Quad)	Line Length ~45 km (Quad) • 400 kV line bays at Fatehgarh-IV PS (Sec-2) – 2 nos. • 400 kV line bays at Barmer-I PS – 2 nos.
7	Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Ghiror (Distt. Mainpuri) along with 2x240 MVAr (765kV) & 2x125 MVAr (420kV) bus reactor at Ghiror S/s (UP) **Future provisions at Ghiror S/s:** **Space for** • 765/400kV ICTs along with bays- 4 • 765 kV line bays along with switchable line reactors – 6 • 765kV Bus Reactor along with bay: 1 nos. • 400 kV line bays along with switchable line reactor –6 • 400 kV Bus Reactor along with bays: 1 no. • 400kV Sectionalizer bay: 1 set • 400/220kV ICT along with bays -4 nos. • 220 kV line bays for drawl -6 nos. • 220kV Sectionalizer bay: 1 set • 220 kV BC (2 nos.) bays and 220 kV TBC (2 nos.) bays • STATCOM (2x±300MVAr, 4x125MVAr MSC, 2x125MVAr MSR) along with 400kV bays (2 nos.)	Ghiror S/s- AIS • 765/400 kV 1500 MVA ICTs- 2 nos. (7x500 MVA including one spare unit) • 765 kV ICT bays-2 no. • 400 kV ICT bays- 2 no. • 765kV line bays : 8 nos. (for LILO of Aligarh(PG)-Orai(PG) D/c, LILO of Agra (PG) – Fatehpur(PG) S/c & 765kV interconnection with Dausa S/s) • 400kV line bays : 2 nos. (for 400kV interconnection with Firozabad (UPPTCL) S/s) • 240 MVAr Bus Reactor-2 no. (7x80 MVAr, including one spare unit) • 765 kV Bus reactor bays-2 no. • 125 MVAr Bus Reactor-2 nos. • 400 kV Bus reactor bays- 2 no. • 110MVAr spare reactor unit (single phase)-1 no.
8	Dausa - Ghiror 765 kV D/c line along with 330MVAr switchable line reactor at Ghiror end and 240 MVAr switchable line reactor at Dausa end for each circuit of Dausa - Ghiror 765 kV D/c line	Line Length -305 km • 765 kV, 240 MVAr switchable line reactors at Dausa S/s end– 2 nos. • 765 kV, 330 MVAr switchable line reactors at Ghiror S/s S/s end– 2 nos. • Switching equipment for 765kV, 240 MVAr switchable line reactors at Dausa S/s end – 2

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
		nos. • Switching equipment for 765kV, 330 MVAr switchable line reactors at Ghiror S/s end – 2 nos.
9	LILO of both ckt of 765 kV Aligarh (PG) - Orai (PG) D/c line at Ghiror S/s along with 240 MVAr switchable line reactor for each circuit at Ghiror S/s end of 765 kV Ghiror - Orai (PG) D/c line	Length -15km (LILO length) • 765 kV, 240 MVAr switchable line reactors at Ghiror S/s end– 2 nos. • Switching equipment for 765kV, 240 MVAr switchable line reactors at Ghiror S/s end – 2 nos.
10	LILO of one ckt of 765kV Agra (PG) – Fatehpur (PG) 2xS/c line at Ghiror along with 240 MVAr switchable line reactor at Ghiror end of 765 kV Ghiror -Fatehpur (PG) line	Length -30km (LILO length) • 765 kV, 240 MVAr switchable line reactors at Ghiror S/s end– 1 no. • Switching equipment for 765kV, 240 MVAr switchable line reactor at Ghiror S/s end – 1 no.
11	400kV Ghiror-Firozabad (UPPTCL) D/c line (Quad)	Line Length ~50 km (Quad)
12	2 nos. 765kV line bays at Dausa S/s	• 765 kV line bays at Dausa S/s – 2 nos
13	2 nos. 400kV line bays at Firozabad (UPPTCL) S/s	• 400 kV line bays at Firozabad (UPPTCL) S/s – 2 nos

Note:

- Developer of Fatehgarh-IV PS (Sec-2) & Barmer-I PS shall provide space for 2 nos. of 400 kV line bays each at Fatehgarh-IV PS (Sec-2) & Barmer-I PS
- Developer of Barmer-I PS shall provide space for STATCOM & associated 2 nos. of 400 kV bays at Barmer-I PS
- UPPTCL shall provide space for 2 nos. of 400 kV line bays at Firozabad S/s
- POWERGRID shall provide space for 2 nos. of 765 kV line bays at Dausa S/s along with space for 2 no. of 240 MVAR switchable line reactors

4.2.2 Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-4 :3.5 GW): Part B

Estimated Cost: Rs 6,259.29 Cr

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/ no. of bays etc.)
1	➢ Establishment of 765/400 kV, 2x1500 MVA S/s at suitable location near Merta (Merta-II Substation) along with 2x240 MVAr (765kV) & 2x125 MVAr (420kV) bus reactor at Merta-II S/s **Future provisions at Merta-II S/s:** **Space for** • 765/400kV ICTs along with bays- 4 • 765 kV line bays along with switchable line reactors – 8 • 765kV Bus Reactor along with bay: 1 nos. • 400 kV line bays along with switchable line reactor –8 nos. • 400 kV line bays – 2 nos. • 400 kV Bus Reactor along with bays: 1 no. • 400kV Sectionalizer bay: 2 sets • 400/220kV ICTs along with bays -6 nos. • 220 kV line bays for RE injection -8 nos. • 220kV Sectionalizer bay: 2 set • 220 kV BC (3 nos.) bays and 220 kV TBC (3 nos.) bays • 6000 MW, ±800 kV Merta (HVDC) [LCC] terminal station (4x1500 MW) along with bays • STATCOM (2x±300MVAr, 4x125MVAr MSC, 2x125MVAr MSR) along with 400kV bays (2 nos.)	**Merta-II S/s -AIS** • 765/400 kV 1500 MVA ICTs- 2 nos. (7x500 MVA including one spare unit) • 765 kV ICT bays-2 no. • 400 kV ICT bays- 2 no. • 765kV line bays: 4 nos. (for 765kV interconnection with Dausa S/s & Barmer-I PS) • 400kV line bays: 2 nos. (for 400kV interconnection with Beawar S/s) • 240 MVAr Bus Reactor-2 no. (7x80 MVAr, including one spare unit) • 765 kV Bus reactor bays-2 no. • 125 MVAr Bus Reactor-2 nos. • 400 kV Bus reactor bays- 2 no. • 110MVAr spare reactor unit (single phase)-1 no.
2	Barmer-I PS – Merta-II 765 kV D/c line along with 330 MVAr switchable line reactor for each circuit at each end of Barmer-I PS – Merta-II 765 kV D/c line	Line Length -345 km • 765 kV, 330 MVAr switchable line reactors at Barmer-I PS end– 2 nos. • 765 kV, 330 MVAr switchable line reactors at Merta-II S/s end– 2 nos. • Switching equipment for 765kV, 330 MVAr switchable line reactors at Barmer-I PS end – 2 nos.

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/ no. of bays etc.)
		• Switching equipment for 765kV, 330 MVAr switchable line reactors at Merta-II S/s end – 2 nos. • 110MVAr spare reactor unit at Barmer-I PS (single phase)-1 no.
3	Merta-II – Beawar 400 kV D/c line (Quad)	Line Length ~55 km (Quad)
4	Merta-II – Dausa 765 kV D/c line along with 240 MVAr switchable line reactor for each circuit at each end of Merta-II – Dausa 765kV D/c line line	Line Length -250 km • 765 kV, 240 MVAr switchable line reactors at Dausa S/s end– 2 nos. • 765 kV, 240 MVAr switchable line reactors at Merta-II S/s end– 2 nos. • Switching equipment for 765kV, 240 MVAr switchable line reactors at Dausa S/s end – 2 nos. • Switching equipment for 765kV, 240 MVAr switchable line reactors at Merta-II PS end – 2 nos.
5	2 nos. 765kV line bays each at Barmer-I PS & Dausa S/s	• 765 kV line bays at Barmer-I PS – 2 nos. • 765 kV line bays at Dausa S/s – 2 nos
6	2 nos. 400kV line bays at Beawar S/s	• 400 kV line bays at Beawar S/s – 2 nos.

Note:

- Developer of Barmer-I PS shall provide space for 2 nos. of 765 kV line bays along with space for 2 no. of 330 MVAR switchable line reactor and space for spare reactor unit (110 MVAr) at Barmer -I PS
- Sterlite shall provide space for 2 nos. of 400 kV line bays at Beawar S/s
- POWERGRID shall provide space for 2 nos. of 765 kV line bays at Dausa S/s along with space for 2 no. of 240 MVAR switchable line reactor

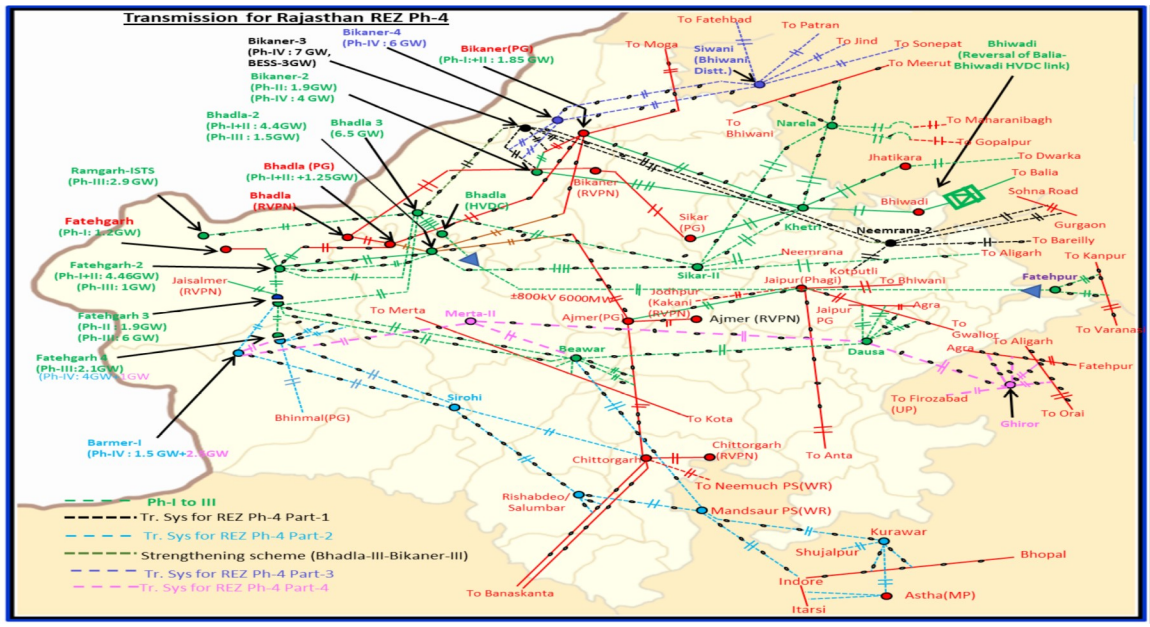


Fig: Transmission system for Rajasthan REZ Ph-IV (Part-4 :3.5GW) [Fatehgarh/Barmer complex]

Members may deliberate.

4.3 System strengthening at Koppal-II and Gadag-II for integration of RE generation projects

4.3.1 Koppal-II 765/400/220kV PS is being established as part of 500 GW RE capacity by 2030 and presently is under construction with implementation schedule of 24 months i.e. Dec'2025. Presently, 2x1500 MVA, 765/400 kV ICTs, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV line bays under Koppal-II Phase-A and augmentation with 2x1500 MVA, 765/400 kV ICTs, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV additional line bays under Koppal-II Phase-B are under implementation.

Gadag-II PS is being established as part of 500 GW RE capacity by 2030 and presently is under construction with implementation schedule of 24 months i.e. Dec'2025. Presently, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV line bays under Gadag-II Phase-A is under implementation.

Large number of applications received from various RE developers seeking connectivity at Koppal-II PS and Gadag-II PS. Further, as RE potential in Gadag area is being integrated with Koppal-II PS through Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c lines and evacuation of power from Gadag-II PS is contingent upon Koppal-II PS. Accordingly, augmentation of transformation capacity at Koppal-II and Gadag-II for evacuation of power from RE generation projects has been identified in a progressive manner as per the receipt of applications in various CMETS-SR meetings. The details of strengthening is as below:

Koppal-II 765/400/220 kV PS

- Augmentation of 1x1500 MVA (5th), 765/400 kV ICT at Koppal-II PS and 1 No. of 220 kV line bays for integration of RE generation projects {agreed in 23rd CMETS-SR held on 29.09.2023}

- Augmentation by 3x500 MVA, 400/220 kV ICTs (5th, 6th & 7th) and 1x1500 MVA 765/400 kV ICT (6th) at Koppal-II PS {agreed in 25th CMETS-SR held on 28.11.2023}.

- Augmentation by 2x500 MVA, 400/220 kV ICTs (8th & 9th), 1x1500 MVA 765/400 kV ICT (7th) at Koppal-II PS and 3 nos. of 220 kV line bays for integration of RE generation projects {agreed in 27th CMETS-SR held on 30.01.2024}

  So far connectivity of about 4,127 MW has been granted / agreed for grant at 220 kV level of Koppal-II PS.

Gadag-II 400/220 kV PS

- Augmentation by 3x500 MVA (3rd, 4th & 5th), 400/220kV transformation capacity at Gadag-II PS and 1 nos. of 400 kV line bay & 2 nos. 220kV line bays for integration of RE generation projects {agreed in 23rd CMETS-SR held on 29.09.2023}

- Augmentation by 2x500 MVA (6th & 7th), 400/220 kV transformation capacity at Gadag-II PS, Gadag-II PS – Koppal-II PS 400kV (Quad) 2nd D/c line and 1 nos. of 220kV line bay for integration of RE generation projects {agreed in 25th CMETS-SR held on 28.11.2023}

- Augmentation by 2x500 MVA, 400/220 kV ICTs (8th & 9th) at Gadag-II PS and 1 nos. of 220 kV line bay for integration of RE generation projects {agreed in 27th CMETS-SR held on 30.01.2024}

  So far connectivity of about 5,276 MW (3476 MW at 220 kV and 1800 MW at 400 kV level) has been granted / agreed for grant at Gadag-II PS.

  The Transmission Scheme for strengthening at Koppal-II and Gadag-II for integration of RE generation projects was forwarded to SRPC for views on 08.02.2024 and same was deliberated in the 50th SRPC meeting held on 16.03.2024. SRPC vide letter dated 19.03.2024 has forwarded the views of Southern Region constituents.

4.3.2 Details of the proposed scheme is given below:

(i) System strengthening at Koppal-II for integration of RE generation projects

Sl. No.	Items	Details					
1.	Name of Scheme	System strengthening at Koppal-II for integration of RE generation projects					
2.	Scope of the scheme						
		Package	***Scope of the Transmission Scheme***	***Capacity /km***	***Schedule***	***CMETS-SR***	***Est. Cost (crs.)***
		A	Augmentation of 1x1500 MVA (5th), 765/400 kV transformation capacity at Koppal-II PS	• 1x1500 MVA, 765/400kV ICT • 765kV ICT bay – 1 No. • 400kV ICT bay – 1 No.	Dec'25	23rd held on 29.09.23	125
		B	Augmentation of 1x1500 MVA (6th), 765/400 kV transformation capacity at Koppal-II PS	• 1x1500 MVA, 765/400kV ICT • 765kV ICT bay – 1 No. • 400kV ICT bay – 1 No.	Dec'25	25th held on 28.11.23	295
			Augmentation of 3x500 MVA, 400/220kV ICTs (5th 6th & 7th) at Koppal-II PS	• 3x500 MVA, 400/220kV ICTs • 400kV ICT bay – 3 Nos. • 220kV ICT bay – 3 Nos.	Dec'25		
			1 no. 220kV line bay at Koppal-II PS for termination of dedicated transmission line of M/s Tata Power Renewable Energy Ltd.	• 220kV line bays – 1 Nos.	01.03.26		
		C	Augmentation of 1x1500 MVA (7th), 765/400 kV transformation capacity at Koppal-II PS	• 1x1500 MVA, 765/400kV ICT • 765kV ICT bay – 1 No. • 400kV ICT bay – 1 No.	Dec'25	27th held on 30.01.24	253
			Augmentation of 2x500 MVA, 400/220kV ICTs (8th & 9th) at Koppal-II PS	• 2x500 MVA, 400/220kV ICTs • 400kV ICT bay – 2 Nos.	Dec'25		

<table>
<tr><th>Sl. No.</th><th>Items</th><th colspan="6">Details</th></tr>
<tr><td></td><td></td><td>Package</td><td>Scope of the Transmission Scheme</td><td>Capacity /km</td><td>Schedule</td><td>CMETS-SR</td><td>Est. Cost (crs.)</td></tr>
<tr><td></td><td></td><td></td><td></td><td>• 220kV ICT bay – 2 Nos.</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>2 nos. 220kV line bays at Koppal-II PS for termination of dedicated transmission line of M/s JSP Green Wind 1 Pvt. Ltd. and Gadag Power India Pvt. Ltd.</td><td>• 220kV line bays – 2 Nos.</td><td>30.12.25</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>1 no. 220kV line bay at Koppal-II PS for termination of dedicated transmission line of M/s Clean Renewable Energy Hybrid Two Pvt. Ltd.</td><td>• 220kV line bays – 1 Nos.</td><td>31.12.26</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td colspan="4">Total Cost</td><td>673</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on Transmission Grid Map</td><td colspan="6">Given in the below figure</td></tr>
<tr><td>4.</td><td>Upstream/ downstream system associated with the scheme</td><td colspan="6">Not applicable</td></tr>
<tr><td>5.</td><td>Objective / Justification</td><td colspan="6">Koppal-II 765/400/220 kV PS is being established as part of 500 GW RE capacity by 2030 and presently is under construction with implementation schedule of 24 months i.e. Dec’2025. Presently, 2x1500 MVA, 765/400 kV ICTs, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV line bays under Koppal-II Phase-A and augmentation with 2x1500 MVA, 765/400 kV ICTs, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV additional line bays under Koppal-II Phase-B are under implementation.

Gadag-II PS is being established as part of 500 GW RE capacity by 2030 and presently is under construction with implementation schedule of 24 months i.e. Dec’2025. Presently, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV line bays under Gadag-II Phase-A is under implementation.</td></tr>
</table>

Sl. No.	Items	Details
		CTU has received large number of applications from various RE developers seeking connectivity at Koppal-II PS and Gadag-II PS. Further, as RE potential in Gadag area is being integrated with Koppal-II PS through Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c lines and evacuation of power from Gadag-II PS is contingent upon Koppal-II PS. Accordingly, augmentation of transformation capacity at Koppal-II and Gadag-II for evacuation of power from RE generation projects has been identified in a progressive manner as per the receipt of applications in various CMETS-SR meetings. The details of strengthening is as below: Koppal-II 765/400/220 kV PS • Augmentation by 1x1500 MVA (5th), 765/400 kV ICT at Koppal-II PS and 1 nos. of 220kV line bays for integration of RE generation projects {agreed in 23rd CMETS-SR held on 29.09.2023 • Augmentation by additional 3x500 MVA, 400/220 kV ICTs (5th, 6th & 7th) and 1x1500 MVA 765/400kV ICT (6th) at Koppal-II PS {agreed in 25th CMETS-SR held on 28.11.2023 • Augmentation by additional 2x500 MVA, 400/220 kV ICTs (8th & 9th), 1x1500 MVA 765/400 kV ICT (7th) at Koppal-II PS and 3 nos. of 220kV line bays for integration of RE generation projects {agreed in 27th CMETS-SR held on 30.01.2024 So far connectivity of about 4127 MW has been granted / agreed for grant at 220 kV level of Koppal-II PS.
6.	Estimated Cost	**Package A - Rs. 125 Crore** **Package B - Rs. 295 Crore** **Package C - Rs. 253 Crore** **Total – Rs. 673 Crore**
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	A. ATC (considering Levelized Tariff @15% of estimated cost): Rs. 100.95 Crore B. Present ATC: Rs. 46024.95 Crore * C. A/B (%): 0.219 %
8.	Need of phasing, if any	Not Applicable

Sl. No.	Items	Details
9.	Implementation timeframe	**Progressively from Dec'25 to Dec'26**
10.	Inclusion of any wild life/protected area along the transmission line route	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required to be done.
11.	Deliberations with RPC along with their comments	The scheme was discussed in the 50th SRPC meeting held on 16.03.2024 (MoM awaited). SRPC vide letter dated 19.03.2024 has forwarded the views on the scheme
12.	System Study for evolution of the proposal	The augmentation of ICTs and line bays at Koppal-II PS has been agreed for grant of connectivity to RE generation projects.

(ii) System strengthening at Gadag-II for integration of RE generation projects

Sl. No.	Items	Details					
1.	Name of Scheme	System strengthening at Gadag-II for integration of RE generation projects					
2.	Scope of the scheme	***Package***	***Scope of the Transmission Scheme***	***Capacity /km***	***Schedule***	***CMETS-SR***	***Est. Cost (crs.)***
		A	Augmentation of 3x500 MVA (3rd, 4th & 5th), 400/220kV transformation capacity at Gadag-II PS	• 3x500 MVA, 400/220kV ICTs • 400kV ICT bay – 3 Nos. • 220kV ICT bay – 3 Nos.400kV ICT bay – 1 No.	Dec'25	23rd held on 29.09.23	189
			1 no. 400kV line bay at Gadag-II PS for	• 400kV line bays – 1 Nos.	30.12.25		

Sl. No.	Items	Details					
		Package	***Scope of the Transmission Scheme***	***Capacity /km***	***Schedule***	***CMETS-SR***	***Est. Cost (crs.)***
			termination of dedicated transmission line of M/s Serentica Renewables India Pvt. Ltd.				
			2 no. 220kV line bays at Gadag-II PS for termination of dedicated transmission line of M/s Tata Power Renewable Energy Ltd. and M/s Avaada Energy Pvt. Ltd.	• 220kV line bays – 2 Nos.	30.12.25		
		B	Augmentation of 2x500 MVA (6th & 7th), 400/220 kV transformation capacity at Gadag-II PS	• 2x500 MVA, 400/220kV ICTs • 400 kV ICT bay – 2 Nos. • 220 kV ICT bay – 2 Nos.	24 months	25th held on 28.11.23	359
			Gadag-II PS – Koppal-II PS 400 kV (Quad) 2nd D/c line	~ 45 km • 400 kV line bays – 2 nos. (at Koppal-II PS) • 400 kV line bays – 2 nos. (at Gadag-II PS)	24 months		
			1 nos. 220 kV line bay at Gadag-II PS for termination of dedicated transmission line of M/s Renew Vayu Energy Pvt. Ltd.	• 220 kV line bays – 1 Nos.	31.03.27		
		C	Augmentation of 2x500 MVA, 400/220 kV ICTs (8th & 9th) at Gadag-II PS	• 2x500 MVA, 400/220 kV ICTs • 400 kV ICT bay – 2 Nos. • 220 kV ICT bay – 2 Nos.	24 months	27th held on 30.01.24	116

<table>
<tr><th>Sl. No.</th><th>Items</th><th colspan="6">Details</th></tr>
<tr><td></td><td></td><td>Package</td><td>Scope of the Transmission Scheme</td><td>Capacity /km</td><td>Schedule</td><td>CMETS-SR</td><td>Est. Cost (crs.)</td></tr>
<tr><td></td><td></td><td></td><td>1 nos. 220kV line bay at Gadag-II PS for termination of dedicated transmission line of M/s Green Infra Renewable Projects Ltd.</td><td>• 220 kV line bays – 1 Nos.</td><td>01.06.27</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td colspan="4">Total Cost</td><td>664</td></tr>
<tr><td>3.</td><td>Depiction of the scheme on Transmission Grid Map</td><td colspan="6">Given in the below figure</td></tr>
<tr><td>4.</td><td>Upstream/ downstream system associated with the scheme</td><td colspan="6">Not applicable</td></tr>
<tr><td>5.</td><td>Objective / Justification</td><td colspan="6">Koppal-II 765/400/220 kV PS is being established as part of 500 GW RE capacity by 2030 and presently is under construction with implementation schedule of 24 months i.e. Dec’2025. Presently, 2x1500 MVA, 765/400 kV ICTs, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV line bays under Koppal-II Phase-A and augmentation with 2x1500 MVA, 765/400 kV ICTs, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV additional line bays under Koppal-II Phase-B are under implementation.

Gadag-II PS is being established as part of 500 GW RE capacity by 2030 and presently is under construction with implementation schedule of 24 months i.e. Dec’2025. Presently, 2x500 MVA, 400/220 kV ICTs and 04 nos. of 220 kV line bays under Gadag-II Phase-A is under implementation.

CTU has received large number of applications from various RE developers seeking connectivity at Koppal-II PS and Gadag-II PS. Further, as RE potential in Gadag area is being integrated with Koppal-II PS through Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c lines and evacuation of power from Gadag-II PS is contingent upon Koppal-II PS. Accordingly, augmentation of transformation capacity at Koppal-II and Gadag-II for evacuation of power from RE generation projects has been</td></tr>
</table>

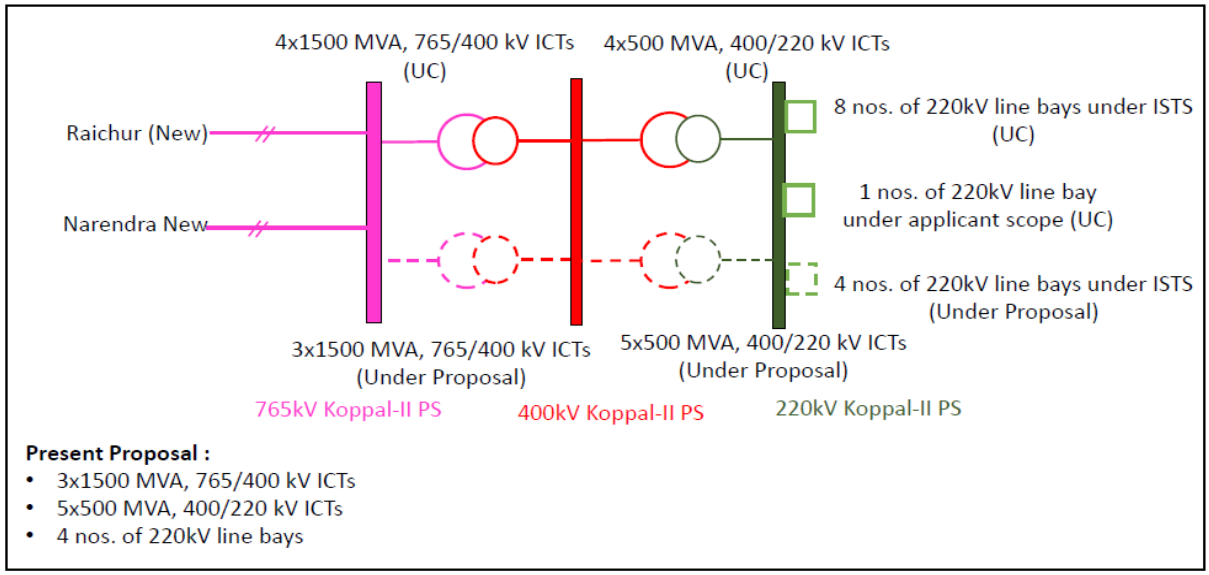
Sl. No.	Items	Details
		identified in a progressive manner as per the receipt of applications in various CMETS-SR meetings. The details of strengthening is as below: Gadag-II 400/220kV PS • Augmentation of 3x500 MVA (3rd, 4th & 5th), 400/220kV transformation capacity at Gadag-II PS and 1 nos. of 400kV line bay & 2 nos. 220kV line bays for integration of RE generation projects {agreed in 23rd CMETS-SR held on 29.09.2023 • Augmentation of 2x500 MVA (6th & 7th), 400/220kV transformation capacity at Gadag-II PS, Gadag-II PS – Koppal-II PS 400kV (Quad) 2nd D/c line and 1 nos. of 220kV line bay for integration of RE generation projects {agreed in 25th CMETS-SR held on 28.11.2023 • Augmentation of 2x500 MVA, 400/220kV ICTs (8th & 9th) at Gadag-II PS and 1 nos. of 220kV line bay for integration of RE generation projects {agreed in 27th CMETS-SR held on 30.01.2024 So far connectivity of about 5276 MW (3476 MW at 220 kV and 1800 MW at 400 kV level) has been granted / agreed for grant at Gadag-II PS.
6.	Estimated Cost	**Package A - Rs. 189 Crore** **Package B - Rs. 359 Crore** **Package C - Rs. 116 Crore** **Total – RS. 664 Crore**
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	A. ATC (considering Levelized Tariff @15% of estimated cost): Rs. 99.6 Crore B. Present ATC: Rs. 46024.95 Crore * C. A/B (%): 2164 %
8.	Need of phasing, if any	Not Applicable
9.	Implementation timeframe	**Progressively from Dec'25 to June, 27**
10.	Inclusion of any wild	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required

Sl. No.	Items	Details
	life/protected area along the transmission line route	to be done.
11.	Deliberations with RPC along with their comments	The scheme was discussed in the 50th SRPC meeting held on 16.03.2024. In the meeting it was noted that the views of AP (LGB consideration in studies) & TN (Offsetting of RE in other regions) would be communicated to CTUIL as views of SRPC for further taking up with NCT SRPC vide letter dated 19.03.2024 has forwarded the views on the scheme
12.	System Study for evolution of the proposal	The augmentation of ICTs, line and line bays at Gadag-II has been agreed for grant of connectivity to RE generation projects.

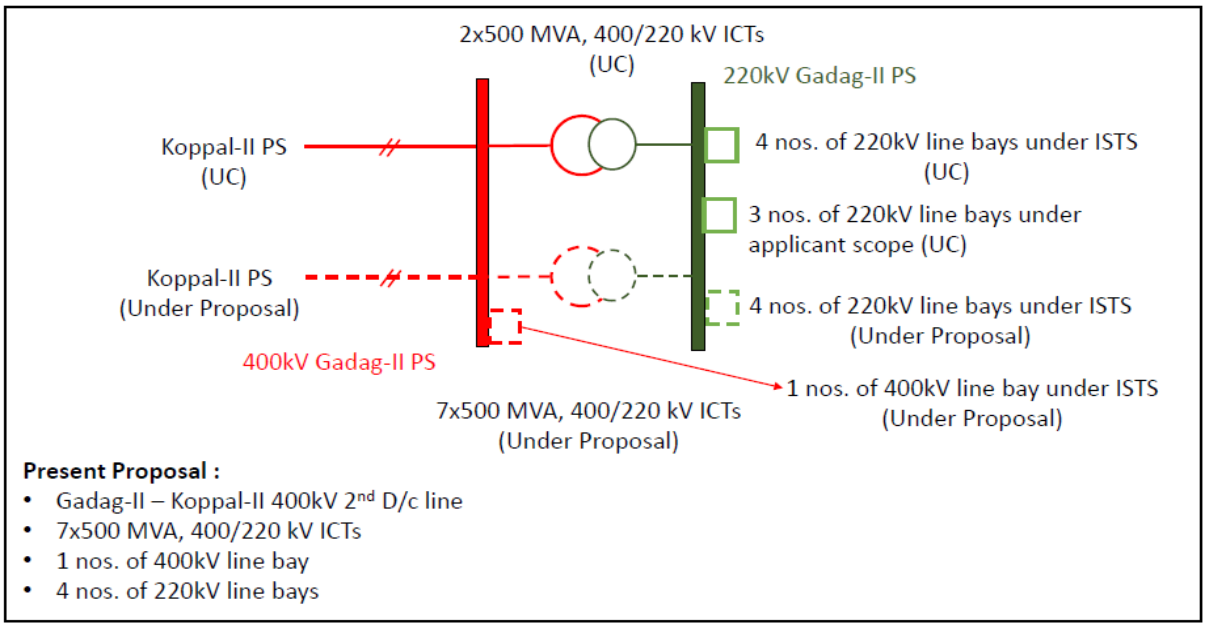
**Total YTC allowed for Dec'23 as per Notification of Transmission Charges payable by DICs for Billing Month of February, 2024 dated 25.01.2024 posted on NLDC website.*

4.3.3 Schematic of the above scheme is given below:

(i) **System strengthening at Koppal-II for integration of RE generation projects**



(ii) System strengthening at Gadag-II for integration of RE generation projects



4.3.4 Further, CTUIL vide e mail dated 04.04.2024 has submitted the following bay augmentation works at Koppal-II & Gadag-II. **The details of the schemes are summarized below:**

Sl. No.	Name of Scheme	State(s)	CMETS-SR	Schedule	Estimated Cost (Rs. Crore)
1.	System strengthening at Koppal-II for integration of RE generation projects				
D	1 nos. of 220 kV line bays at Koppal-II PS for termination of dedicated transmission line of M/s Torrent Solar Power Pvt Ltd.	Karnataka	28th held on 29.02.2024	31.01.26	5.7
	1 nos. of 220kV line bays at Koppal-II PS for termination of dedicated transmission line of M/s Tata Power Renewable Energy Ltd.			01.03.26	5.7
			Sub-Total		**11.4**
2.	System strengthening at Gadag-II for integration of RE generation projects				
D	1 no. of 220kV line bays at Gadag-II PS for termination of dedicated transmission line of M/s NTPC Renewable Ltd.	Karnataka	28th held on 29.02.2024	31.07.26 (tentative)	6
			Sub-Total		**6**
			Total		**17.4**

It is further to inform that connectivity of about 4,174 MW (at 220 kV level) at Koppal-II PS and 5,276 MW (3476 MW at 220 kV and 1800 MW at 400 kV level) at Gadag-II PS respectively have been granted / agreed for grant. The above 220 kV line bays are required to be implemented under ISTS for termination of dedicated transmission lines from connectivity applicants. The intimations for grant of connectivity are being issued shortly and post intimations the

applicants shall be required to submit the applicable BGs in accordance with CERC GNA regulations, 2022.

The estimated cost of the above schemes is less than INR 100 Cr and the approval of the scheme falls under the purview of CTU. However, the transmission scheme System strengthening at Koppal-II and Gadag-II for integration of RE generation projects has been submitted to NCT with SRPC views for approval and the scheme includes augmentation of ICTs, transmission line and 400kV / 220kV line bays for termination fo dedicated transmission lines of RE generation projects. Accordingly, it is prudent to include the above 220kV line bays in the comprehensive system strengthening at Koppal-II and Gadag-II.

4.3.5 Members may deliberate.

4.4 OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends.

4.4.1 Scheme has been bifurcated into two nos. as below for OPGW and FOTE:

(a) OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends – Part-A

4.4.2 Detailed scope of the scheme is given below:

S. No.	Items	Details
1.	Name of scheme	OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends – Part-A
2.	Scope of the scheme	Supply and installation of 24 Fibre OPGW on 400 kV Kurukshetra - Malerkotla line (140 kms.)
3.	Objective / Justification	OPGW installation on 400 kV D/c Kurukshetra - Malerkotla line (140 kms.) was approved in the 39th, 40th & 47th NRPC meetings held on 02.05.2017,28.10.2017 & 11.12.2019 respectively as part of reliable communication scheme to provide Reliable and Redundant communication to the ISTS wide band nodes of Northern Region. 400kV Kurukshetra - Malerkotla transmission line is owned by M/s NRSS-XXXI (B) Trans Ltd (M/s NTL) (Sekura) and was implemented under TBCB route. Due to ownership issues OPGW work could not be completed on this line under reliable communication scheme of NR awarded to

S. No.	Items	Details
		POWERGRID. In this regard, a petition vide No. 94/MP/2021 had been filed by CTU before Hon'ble Central Electricity Regulatory Commission (CERC) seeking directions regarding installation of OPGW on the 400kV Kurukshetra - Malerkotla transmission line. CERC has issued the order of the said petition on 27.12.23 As per CERC order OPGW work to be awarded to Transmission line asset owner and FOTE to be awarded to the Bay Kisok Owners. M/s NRSS-XXXI (B) Transmission Ltd. (M/s NTL) Is the asset owner of transmission line in this case and Bay owner at both end i.e. Kurukshetra & Malerkotla is POWERGRID. Scheme was deliberated in the 71st NRPC. Where scheme was agreed as OPGW installation by M/s NTL under change in law of TSA and FOTE by POWERGRID at both end i.e. Kurukshetra & Malerkotla under RTM mode.
4.	Estimated Cost	**Rs. 9 crore (approx.) (excluding taxes and duties)**
5.	Implementation timeframe	18 months from the date of allocation
6.	Implementation Agency	M/s NRSS-XXXI (B) Transmission Ltd.
7.	Implementation mode	under "Change in Law" of TSA as per CERC petition order 94/MP/2021 dtd. 27.12.23
8.	Deliberations in different meetings	The scheme was deliberated in the 71st meeting of NRPC

(b) OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends – Part-B

4.4.3 Detailed scope of the scheme is given below:

S. No.	Items	Details
1.	Name of scheme	OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends – Part-B
2.	Scope of the scheme	FOTE (STM-16) at Kurukshetra & Malerkotla locations

S. No.	Items	Details
		(2 nos.)
3.	Objective / Justification	OPGW installation on 400 kV D/c Kurukshetra - Malerkotla line (140 kms.) was approved in the 39th, 40th & 47th NRPC meetings held on 02.05.2017,28.10.2017 & 11.12.2019 respectively as part of reliable communication scheme to provide Reliable and Redundant communication to the ISTS wide band nodes of Northern Region. 400kV Kurukshetra - Malerkotla transmission line is owned by M/s NRSS-XXXI (B) Trans Ltd (NTL) (M/s Sekura) and was implemented under TBCB route. Due to ownership issues OPGW work could not be completed on this line under reliable communication scheme of NR awarded to POWERGRID. In this regard, a petition vide No. 94/MP/2021 had been filed by CTU before Hon'ble Central Electricity Regulatory Commission (CERC) seeking directions regarding installation of OPGW on the 400kV Kurukshetra - Malerkotla transmission line. CERC has issued the order of the said petition on 27.12.23 As per CERC order OPGW work to be awarded to Transmission line asset owner and FOTE to be awarded to the Bay Kisok Owners. M/s NRSS-XXXI (B) Transmission Ltd. (M/s NTL) Is the asset owner of transmission line in this case. And Bay owner at both end i.e. Kurukshetra & Malerkotla is POWERGRID. Scheme was deliberated in the 71st NRPC. Where scheme was agreed as OPGW installation by M/s NTL under change in law of TSA and FOTE by POWERGRID at both end i.e. Kurukshetra & Malerkotla under RTM mode.
4.	Estimated Cost	**0.6 crore (approx.) (excluding taxes and duties)**
5.	Implementation timeframe	18 months from the date of allocation (with matching

S. No.	Items	Details
		time frame of OPGW on 400kV Kurukshetra - Malerkotla transmission line)
6.	Implementation Agency	POWERGRID
7.	Implementation mode	RTM Mode
8.	Deliberations in different meetings	The scheme was deliberated in the 71st meeting of NRPC

4.4.4 Members may deliberate.

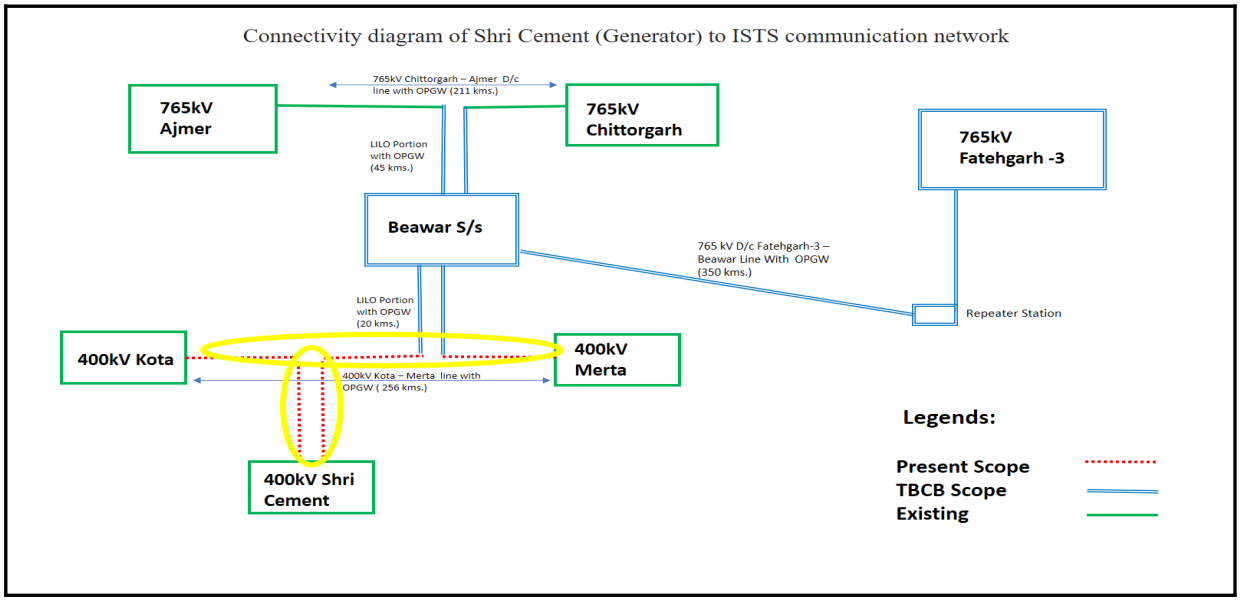
4.5 **OPGW installation on existing 400 kV Kota – Merta line along with LILO portion at Shree Cement**

4.5.1 **Detailed scope of the scheme is given below:**

S. No.	Items	Details
1.	Name of Scheme	OPGW installation on existing 400 kV Kota – Merta line alongwith LILO portion at Shree Cement including FOTE at all 3 locations
2.	Scope of the scheme	OPGW installation on existing 400 kV Kota – Merta line (256kms.) alongwith LILO portion at Shree Cement (55 kms.) including FOTE at all 3 locations. (Total 311 kms.)
3.	Connectivity diagram	Given below
4.	Objective / Justification	**400 kV Kota – Merta line** (256kms.) was constructed without OPGW by POWERGRID and this line is also LILOed at Shree Cement (Captive Merchant Generator). LILO portion of approx. 55 kms. was constructed by M/s Shree Cement. This line is further proposed to be LILOed at **765/400 kV Beawar (ISTS) S/s** under TBCB scheme, where OPGW & FOTE has been considered on LILO portion at Beawar under TBCB scheme. As per feedback received from Grid-India, data of Shree Cement is intermittent due to GPRS/ PLCC connectivity at present. Moreover, Grid-India further mentioned that in future PMUs may also be planned for Shree Cement station under URTDSM Ph-II project. As GPRS/PLCC bandwidth is not

S. No.	Items	Details
		sufficient to transmit PMU data therefore OPGW based communication shall also be required to send the PMU/SCADA/AMR data to NRLDC in a secured & reliable manner. Hence, Grid-India has requested CTU to plan OPGW based connectivity for the same. The agenda for OPGW installation on 400 kV Kota – Merta line (256kms.) along with OPGW installation on LILO portion of Shree Cement alongwith FOTE was discussed in 57th , 69th & 70th NRPC. In the 69th & 70th NRPC, OPGW installation was agreed for the 400 kV Kota – Merta line (256kms.) alongwith LILO portion of Shree Cement (55 kms) including FOTE at all three stations costing approximately Rs. **18.5 crore (approx.)**. This agenda was also deliberated in the 11th NCT, however as decision of LILO portion was pending, therefore same was again put up in RPC and OPGW on LILO portion was also agreed in 69th & 70th NRPC alongwith main line. In view of CERC order on petition no. 94/MP/2021 dtd. 27.12.23, scheme was re-deliberated in the 71st NRPC regarding implementation mode. Where implementation mode was agreed as RTM mode.
5.	Estimated Cost	Rs. 18.5 crore (approx.) (excluding taxes and duties)
6.	Implementation timeframe	24 months from the date of allocation
7.	Implementation Agency and mode	POWERGRID
8.	Implementation mode	RTM mode
9.	Deliberations in different meetings	The scheme was deliberated in the 57th , 69th , 70th , 71st meeting of NRPC & 11th NCT

4.5.2 Schematic of the above scheme is given below:



4.5.3 Members may deliberate.

4.6 OPGW installation on one circuit of existing 765kV Fatehpur-Agra D/c (2x S/c) Line alongwith FOTE which is to be LILOed at new Ghiror S/s (ISTS).

Sl. No.	Items	Details
1.	Name of Scheme	OPGW installation on one circuit of existing of 765kV Fatehpur-Agra D/c (2x S/c) Line which is to be LILOed at new Ghiror S/s (ISTS)
2.	Scope of the scheme	OPGW installation on one circuit of existing 765kV Fatehpur-Agra D/c (2x S/c) Line which is to be LILOed at new Ghiror (ISTS S/s) including FOTE at Fatehpur & Agra locations (Total 335 kms.).
3.	Objective / Justification	Under the transmission scheme for "Transmission system for evacuation of power from Fatehgarh/Barmer Complex as part of Rajasthan REZ Ph-IV (Part-4 :3.5GW) [Fatehgarh/Barmer Complex]" LILO of one circuit of existing 765kV Fatehpur-Agra D/c (2xS/c) Line is proposed on the new Ghiror S/s. On the existing 765kV Fatehpur-Agra D/c (2xS/c) Line OPGW is not available. To provide communication between Fatehpur, Agra & Ghiror Substations OPGW to be installed over the one circuit of 765kV Fatehpur-Agra D/c Line **which is proposed to be LILOed on Ghiror S/s.** Further as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022: *"The primary path for tele-protection shall be on point-to-point Optical Ground Wire".* Therefore, this OPGW also serves as primary tele-protection path for Ghiror – Fatehpur & Ghiror – Agra Lines formed after LILO. Asset owner of 765kV Fatehpur-Agra D/c (2xS/c) Line is POWERGRID

Sl. No.	Items	Details
		(line was constructed under RTM). This scheme was deliberated in the 71st NRPC and agreed by forum. OPGW installation Scheme was also deliberated in view of implementation mode in 72nd NRPC, where a separate scheme was proposed for OPGW installation work (Preferably in matching timeframe with Ph-IV (Part-4 :3.5GW) scheme) minutes of 72nd NRPC are awaited.
4.	Estimated Cost	**Rs. 16.5 crore (approx.) (excluding taxes and duties)**
5.	Implementation timeframe	24 months from the date of allocation (Preferably in matching timeframe with Ph-IV (Part-4 :3.5GW) scheme)
6.	Implementation Agency and mode	POWERGRID
7.	Implementation mode	RTM mode
8.	Deliberations in different meetings	The scheme was deliberated in the 71st & 72nd meeting of NRPC.

4.7 Redundant communication for Fatehgarh-I (Adani) station

4.7.1 Detailed scope of the scheme is given below:

S. No.	Items	Details
1.	Name of Scheme	Supply and installation of OPGW on 400kV Fatehgarh-I (Adani) - Fatehgarh-II (PG) line **(6.5 kms.)** upto LILO portion of Fatehgarh-II (PG). (Fatehgarh-I (Adani) – Bhadla (PG) line owned by Adani LILOed at Fatehgarh-II)
2.	Scope of the scheme	Supply and installation of OPGW on 400kV Fatehgarh-I (Adani) - Fatehgarh-II (PG) line **(6.5 kms.)** upto LILO portion of Fatehgarh-II (PG) by replacing the existing earthwire (on 2nd E/W peak) in Live Line installation.
3.	Connectivity diagram	Given below
4.	Objective / Justification	At present Fatehgarh-I (Adani) is connected with Bhadla (PG) via LILO at Fatehgarh-II (PG) with 24F OPGW on one E/W peak of Fatehgarh-I – Bhadla (PG) line. On the LILO portion of Fatehgarh-II, OPGW (24F) is also installed from LILO point to Fatehgarh-II (PG) for both Loop-In and Loop-Out portion. However, one no. OPGW is being used for earthwire functionality only as it is not continued upto Fatehgarh-I (Adani) end.

S. No.	Items	Details
		As per the inputs received from Adani & POWERGRID, present connectivity is shown in the below figure where 12 fibre are used for LILO of Fatehgarh-I (Adani) – Bhadla(PG) at Fatehgarh-II (PG) and 12 nos. of fibre bypassed towards Bhadla (PG) station. It is proposed that 6.5kms. 24F OPGW may be installed on the second peak of 400kV Fatehgarh-I (Adani)-Fatehgarh-II (PG) line by replacing the earthwire with OPGW in live line condition upto LILO point of Fatehgarh-II (PG) shown in figure. The LILO portion of Fatehgarh-II(PG) upto LILO point is owned by POWERGRID. This shall provide redundant communication for Fatehgarh-I (Adani) station upto Fatehgarh-II (PG). Additional FOTE are not required for this configuration as existing FOTE shall be used. Further as Fatehgarh-II (PG) & Bhadla (PG) are connected with other ISTS wideband nodes and thus provide two redundant paths. In view of CERC order of petition no. 94/MP/2021 dtd. 27.12.23, scheme was again deliberated in the 71st NRPC for implementation mode. Where implementation mode was agreed as change in law as per Petition order.
5.	Estimated Cost	**Rs. 32.5 Lakhs (approx.) (excluding taxes and duties)**
6.	Implementation timeframe	18 months from the date of allocation
7.	Implementation Agency	Adani Transmission Limited
8.	Implementation mode	under “Change in Law” of TSA as per CERC petition order 94/MP/2021 dtd. 27.12.23
9.	Deliberations in different meetings	The scheme was deliberated in the 22nd & 23rd TeST meeting of NRPC and 69th, 70th , 71st NRPC meeting.

4.7.2 Schematic of the above scheme is given below:

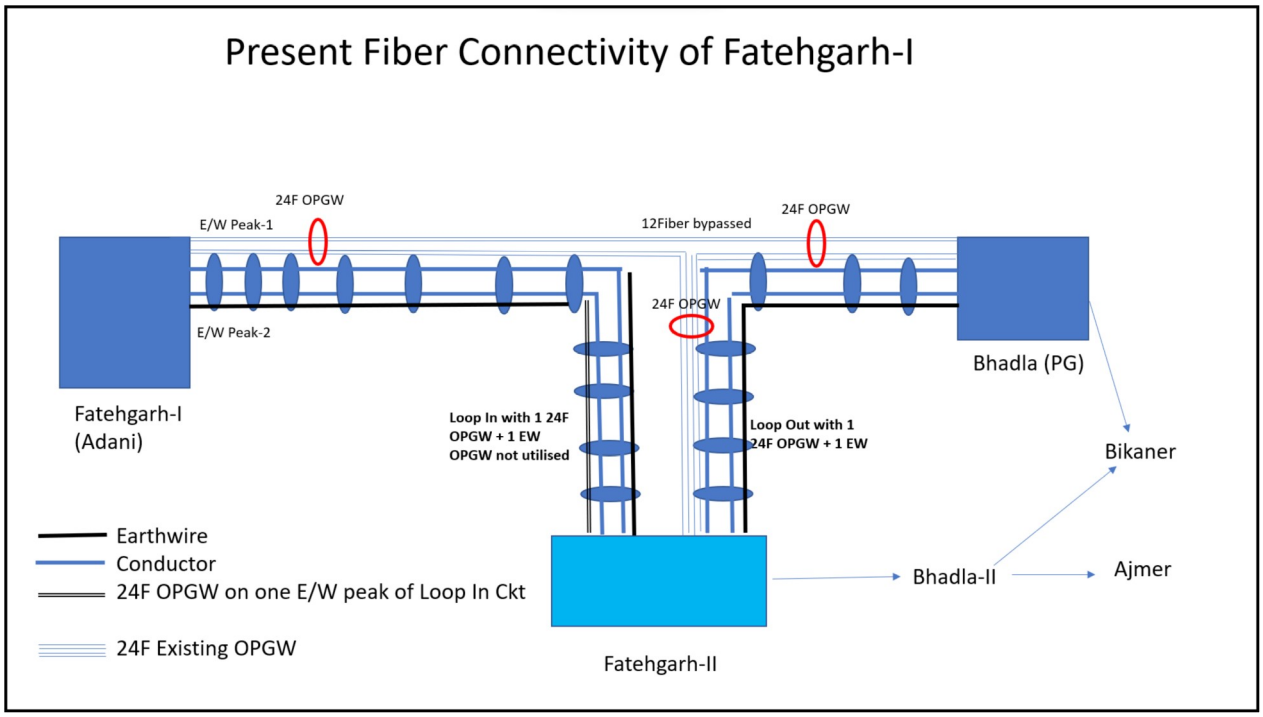


Figure-1

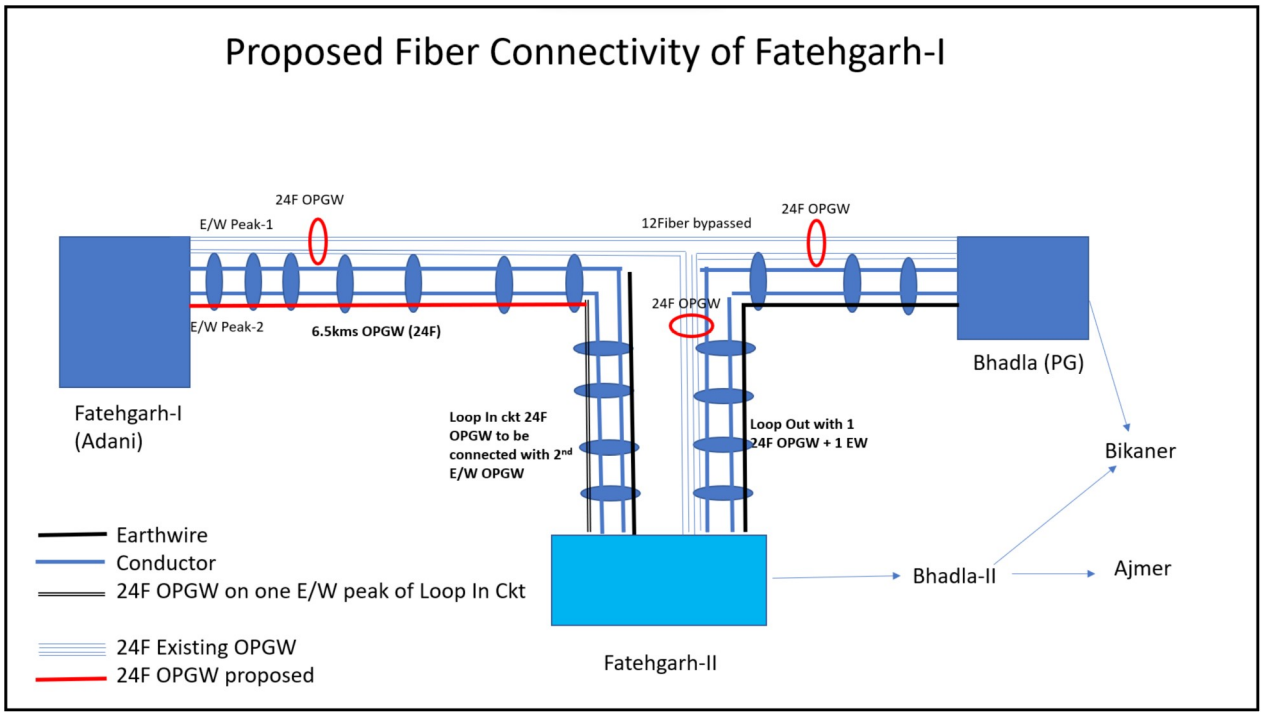


Figure-2

4.7.3 Members may deliberate.

4.8 **Additional FOTE / Cards in view of resource disjoint and critical locations.**

4.8.1 **Detailed scope of the scheme is given below:**

S. No.	Items	Details
1.	Name of Scheme	Additional FOTE / Cards in view of resource disjoint and critical locations
2.	Scope of the scheme	Supply and Installation of 12 nos. new FOTE and additional ethernet cards (125 nos.) for existing FOTE in view of resource disjoint and critical locations.
3.	Details of FOTE locations	Given below
4.	Objective / Justification	As per CEA Manual of communication Planning which states as per clause no 4.1.2 that communication resources like FOTE and Media should be resource disjoint. Inputs for such locations where additional FOTE and ethernet cards for existing FOTE are required, has been provided by POWERGRID for NR. Details of the new FOTE locations are given below**.** The supply and Installation of 12 nos. new FOTE and additional ethernet cards is proposed in view of grid operation. This agenda was discussed in the 2nd & 4th CPM of Northern Region & 23rd TeST meeting and agreed in the 69th, 70th NRPC meeting. In view of CERC order of petition no. 94/MP/2021 dtd. 27.12.23, scheme was re-deliberated in the 71st NRPC for implementation mode. Where implementation mode was agreed as RTM for such cases.
5.	Estimated Cost	**Rs. 5.2 Crore approx. (excluding taxes and duties)**
6.	Implementation timeframe	12 months from the date of allocation
7.	Implementation Agency	POWERGRID
8.	Implementation Mode	RTM mode
9.	Deliberations in different meetings	This agenda was discussed in the 2nd & 4th CPM of Northern Region & 23rd TeST meeting and 69th , 70th , 71st NRPC meeting.

4.8.2 **Details of FOTE locations:**

S No.	Name	Required FOTE
1	Mandola	1
2	DTL Bawana	1
3	Muradnagar	1
4	SLDC, RRVPNL (Jaipur)	1
5	SLDC, HVPNL (Panipat)	1
6	SLDC, BBMB (Chandigarh)	1
7	SLDC, DTL (New Delhi)	1
8	SLDC, HPSEBL (Shimla)	1
9	SLDC J&K PDD (Jammu)	1
10	SLDC Lucknow (UPPTCL)	1
11	SLDC PSTCL (Patiala)	1
12	SLDC PTCUL (Dehradun)	1

Total No. of FOTE- 12.

4.8.3 Members may deliberate.

4.9 **FOTE at Backup SLDCs & Backup NRLDC**

4.9.1 **Detailed scope of the scheme is given below:**

S. No.	Items	Details
1.	Name of Scheme	Supply and Installation of 11 nos. FOTE at Backup SLDCs in Northern Region & Backup NRLDC (Guwahati)
2.	Scope of the scheme	Supply and Installation of 11 nos. FOTE at Backup SLDCs in Northern Region & Backup NRLDC (Guwahati)
3.	Details of FOTE locations	Given below
4.	Objective / Justification	Grid-India vide their letter dtd. 18.07.2023 requested planning communication system for upcoming Backup NRLDC at Guwahati and ICCP communication from Main & Backup SLDCs to Backup NRLDC.

S. No.	Items	Details
		As per the new architecture proposed by Grid-India, backup NRLDC is proposed at NER – Guwahati and backup SLDCs in each state of Northern Region. Further, Main and backup SLDC shall report to main and backup RLDC respectively. This agenda was discussed in the 4th CPM of NR, 23rd TeST meeting of NRPC and agreed in 69th &70th NRPC meeting. Locations alongwith FOTE requirement is given below. In view of CERC order of petition no. 94/MP/2021 dtd. 27.12.23, scheme was re-deliberated in the 71st NRPC for implementation mode. Where implementation mode was agreed as RTM.
5.	Estimated Cost	**Rs. 3.3 Crore approx. (excluding taxes and duties)**
6.	Implementation timeframe	12 months from the date of allocation
7.	Implementation agency	POWERGRID
8.	Implementation Mode	RTM mode
9.	Deliberations in different meetings	This agenda was discussed in the 4th CPM of northern region & 23rd TeST meeting and 69th ,70th, 71st NRPC meeting.

4.9.2 Details of FOTE locations:

Sr No.	Name	Backup CC location	FOTE
1	Backup NRLDC	Guwahati	2
2	SLDC, RRVPNL (Jaipur)	Sub-LDC Bhilwara	1
3	SLDC, HVPNL (Panipat)	HW, Shakti Bhawan Panchkula	1
4	SLDC, BBMB (Chandigarh)	SLDC, Patiala, Punjab	0
5	SLDC, DTL (New Delhi)	400kV Bamnauli (ALDC Bldg)	2
6	SLDC, HPSEBL (Shimla)	Sub-LDC Hamirpur	1
7	SLDC JKPTCL (Jammu)	Backup SLDC Srinagar	2
8	SLDC Lucknow (UPPTCL)	SLDC Modipuram (UPPTCL)	1
9	SLDC PSTCL (Patiala)	SLDC, BBMB (Chandigarh)	0
10	SLDC PTCUL (Dehradun)	Backup SLDC Kashipur	1
		Total	**11**

Total No. of FOTE- 11.

4.9.3 Members may deliberate.

5 Presentation by CTUIL

CTUIL may make the presentation apprising NCT of the Rolling Plan.

6 Any other issues, with permission of chair

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