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 इकतालीसवी बैठक का कार्यवृत्त ।

Subject: Minutes of the 41st Meeting of National Committee on Transmission (NCT) – regarding.

महोदया (Madam) / महोदय (Sir),

The 41st meeting of the "National Committee on Transmission" (NCT) was held on 18th May, 2026 at New Delhi. The minutes of the meeting are enclosed herewith.

भवदीय / Yours faithfully

Digitally signed by
Bhagwan Sahay Bairwa
Date: 09-06-2026
11:24:33

(बी.एस.बैरवा / B.S. Bairwa)
मुख्य अभियन्ता एवं सदस्य सचिव,(एन.सी.टी.)/
Chief Engineer & Member Secretary (NCT)

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.	Additional Secretary (Trans), Ministry of Power Shram Shakti Bhawan, New Delhi-110001.
5.	Sh Abhay Bakre, Mission Director/ Shri Rajesh Kulhari, Joint Secretary, MNRE Atal Akshay Urja Bhawan Opposite CGO Complex gate No. 2, Lodhi Road, New Delhi – 110003	6.	Chief Operating Officer, CTUIL, Floors Nos. 5-10, Tower 1, Plot Nos. 16, IRCON International Tower, Institutional Area, Sector 32, Gurugram, Haryana - 122001.
7.	Sh. Rajnath Ram, Adviser (Energy), NITI Aayog, Parliament Street, New Delhi – 110 001.	8.	CMD, Grid Controller of India, B-9 (1st Floor), Qutub Institutional Area, Katwaria Sarai, New Delhi – 110016
9.	Sh. Stephen Fernandes, Chief Electrical Engineer Goa Electricity Department & Chairman, WRPC	10.	Sh. Sanjeev Kumar Sood, Director (Technical), Punjab State Transmission Corporation Limited
11.	Sh. S.R Narasimhan Expert Member	12.	Shri. T Sivakumar (Chairperson, TCC and Managing Director, TANTRANSCO) TANTRANSCO Building,6th Floor,144, Anna Salai, Chennai - 600 002
13.	Shri Ajay Yadav, CMD, BSPHCL Vidyut Bhawan-I, 1st Floor, Bailey Road, Patna- 800001	14.	Sh. Metbah Lyngdoh, Chairman, NERPC & Hon’ble Minister of Power, Shillong, Meghalaya

Special Invitee

1. Chief Engineer (PCD), CEA
2. Chief Engineer (PSETD), CEA
3. CEO, RECPDCL
4. CEO, PFCCL

Table of Minutes

Minutes of the 41st meeting of National Committee on Transmission

1 Confirmation of the minutes of the 40th meeting of National Committee on Transmission

1.1 The minutes of the 40th meeting of NCT held on 15.04.2026 were issued on 27.04.2026 vide CEA letter no. CEA-PS-12-13/3/2019-PSPA-II Division/ I/63906/2026.

1.2 Shri S.R. Narasimhan, Expert Member vide email dated 04.05.2026 mentioned that in the minutes of the 40th meeting of NCT, the decision to evaluate the Energy Storage option in lieu of transmission has not been included at section 4.1.12 and proposed to include the same in the minutes.

1.3 Members confirmed the minutes of the 40th meeting of NCT, with the following modification in para 4.1.12:

4.1.12 After deliberations, following were decided:

a) Another meeting may be convened by CEA, with RE developers who have been granted in-principal connectivity through Bikaner V transmission scheme.

b) CTUIL to analyze implication for the technical minimum requirement of coal stations as 55% instead of 40%.

c) The scheme may be objective wise segregated (scheme required for RE evacuation of Bikaner V PS and Grid strengthening purpose based on Grid-India feedback).

d) Studies need to be carried out to evaluate the Energy Storage option in lieu of transmission.

e) Outcome of the above shall be discussed in next meeting.

2 Status of the transmission schemes noted/approved/recommended to MoP in the 40th meeting of NCT:

2.1 Status of transmission schemes approved/recommended:

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	BPC	Award/ Gazette notification
1.	Supply & Installation of AMR Compatible ISTS Interface Energy Meters along with AMR (Automatic Meter Reading) System under the scheme "5 min Interface Energy Meter along with AMR system"-For all five regions as PAN India level.	Approved	RTM	POWERGRID	CTUIL issued O.M. to implementing agency on 04.05.2026
2.	Unified Real time Dynamic	Recommende	RTM	POWER	MoP issued

Sr. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Mode of Implementation	BPC	Award/ Gazette notification
	State Measurement System (URTDSM) Phase-II ISTS Project	d		GRID	O.M. on 18.05.2026 to CTUIL

2.2 Status of transmission schemes where modifications was suggested/approved in 40th NCT meeting:

S. Nos.	Scheme where modifications was suggested	Status
1.	Modification in Scheme for Installation of OPGW & associated communication systems on the existing ISTS lines in WR Region	CTUIL informed the implementing Agency on 04.05.2026

3 Modifications in the earlier approved/notified transmission schemes

3.1 Modification in future space provisions in the scheme "Transmission system for proposed Green Hydrogen / Green Ammonia projects in Vizag area, Andhra Pradesh (Phase-I)

3.1.1 Representative of CTUIL stated that the transmission system for proposed Green Hydrogen / Green Ammonia projects in Vizag area, Andhra Pradesh (Phase-I) was recommended in the 32nd NCT meeting held on 12.08.2025 for implementation through TBCB mode with an estimated cost of Rs. 8386 Cr. and RECPDCL was identified as BPC for the subject transmission scheme.

3.1.2 He further informed that Pendurthi (Vizag) 765/400 kV substation is proposed as GIS substation and space provision for establishment of 220kV switchyard at Pendurthi in future was kept in the scope of the scheme. Further, the 220kV switchyard will also be GIS in nature. However, in the scope of Future Space Provisions for 220kV switchyard, space for 4 nos. of 220 kV Transfer Bus Coupler (TBC) Bays was inadvertently considered which is not required technically in the case of GIS substation. Accordingly, space for 4 nos. of 220 kV Transfer Bus Coupler (TBC) Bays may be deleted from the scope.

3.1.3 Further, Space provision for 2nd ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS was kept in the scope, however, space for associated 400kV bay for interconnection of 2nd STATCOM was inadvertently missed in the scope. Accordingly, space for 1 no. of 400kV bay for 2nd STATCOM may be included in the future scope.

3.1.4 Representative of CTUIL stated that there is no cost implication due to the

modification of this scheme.

3.1.5 After detailed deliberations, NCT approved the following modification in the future space provisions in the scheme "Transmission system for proposed Green Hydrogen / Green Ammonia projects in Vizag area, Andhra Pradesh (Phase-I):

Sl. No.	Original scope of the Transmission Scheme		Modified scope of the Transmission Scheme	
1.	Establishment of 4x1500 MVA, 765/400 kV Pendurthi (Vizag) GIS substation with 1x330 MVAr (765 kV) bus reactor with space provision for establishment of 220 kV switchyard **Future Space Provisions:** • 765/400kV, 1500 MVA, ICTs – 2 Nos. • 765kV ICT bays – 2 Nos. • 400kV ICT bays – 2 Nos. • 765kV line bays – 8 Nos. (with provision for SLR) • 400kV line bays – 12 Nos. (with provision for SLR) • 400kV Bus Sectionalizer : 1 set **Future Space Provisions for 220kV switchyard:**	• 765/400kV, 1500 MVA, ICTs – 4 Nos. (13x500 MVA incl. 1 spare unit) • 765kV ICT bay – 4 Nos. • 400kV ICT bay – 4 Nos. • 765kV line bays – 2 Nos. (at Pendurthi (Vizag) GIS for termination of Pendurthi (Vizag) – Srikakulam 765 kV D/c line) • 765kV line bays – 2 Nos. with provision of SLR (at Pendurthi (Vizag) GIS for termination of Khammam-II – Pendurthi (Vizag) –765 kV D/c line) • 765 kV, 330 MVAr Bus Reactors – 1 no. (4x110 MVAr inc. 1 switchable spare unit for both bus reactor and line reactor) • 765 kV Bus Reactor bays – 1 no. • 400kV line bays – 4 Nos. (at Pendurthi (Vizag) GIS for	Establishment of 4x1500 MVA, 765/400 kV Pendurthi (Vizag) GIS substation with 1x330 MVAr (765 kV) bus reactor with space provision for establishment of 220 kV **GIS** switchyard **Future Space Provisions:** • 765/400kV, 1500 MVA, ICTs – 2 Nos. • 765kV ICT bays – 2 Nos. • 400kV ICT bays – 2 Nos. • 765kV line bays – 8 Nos. (with provision for SLR) • 400kV line bays – 12 Nos. (with provision for SLR) • 400kV Bus Sectionalizer : 1 set • **400kV bay for 2nd STATCOM – 1 no.** **Future Space Provisions for 220kV GIS**	• 765/400kV, 1500 MVA, ICTs – 4 Nos. (13x500 MVA incl. 1 spare unit) • 765kV ICT bay – 4 Nos. • 400kV ICT bay – 4 Nos. • 765kV line bays – 2 Nos. (at Pendurthi (Vizag) GIS for termination of Pendurthi (Vizag) – Srikakulam 765 kV D/c line) • 765kV line bays – 2 Nos. with provision of SLR (at Pendurthi (Vizag) GIS for termination of Khammam-II – Pendurthi (Vizag) –765 kV D/c line) • 765 kV, 330 MVAr Bus Reactors – 1 no. (4x110 MVAr inc. 1 switchable spare unit for both bus reactor and line reactor) • 765 kV Bus Reactor bays – 1 no. • 400kV line bays – 4 Nos. (at Pendurthi (Vizag) GIS for

Sl. No.	Original scope of the Transmission Scheme		Modified scope of the Transmission Scheme	
	• 400/220kV, 500 MVA, ICTs – 10 Nos. • 400kV ICT bays – 10 Nos. • 220kV ICT bays – 10 Nos. • 220kV line bays – 16 Nos. • 220kV Bus Sectionalizer : 3 set • 220 kV Bus Coupler (BC) Bay – 4 Nos. • 220 kV Transfer Bus Coupler (TBC) Bay – 4 Nos.	termination of LILO of Kalpakka – Maradam 400 kV (quad) D/c line at Pendurthi)	**switchyard:** • 400/220kV, 500 MVA, ICTs – 10 Nos. • 400kV ICT bays – 10 Nos. • 220kV ICT bays – 10 Nos. • 220kV line bays – 16 Nos. • 220kV Bus Sectionalizer : 3 set • 220 kV Bus Coupler (BC) Bay – 4 Nos.	termination of LILO of Kalpakka – Maradam 400 kV (quad) D/c line at Pendurthi)
2.	• ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS with control switching arrangement for proposed 1x330 MVAr bus reactor • Space provision for 2nd ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS	• 400kV bay – 1 no. • ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS with control switching arrangement for proposed 1x330 MVAr bus reactor – 1 set	• ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS with control switching arrangement for proposed 1x330 MVAr bus reactor • Space provision for 2nd ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS **along with associated 400kV bay**	• 400kV bay – 1 no. • ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS with control switching arrangement for proposed 1x330 MVAr bus reactor – 1 set

3.2 **Modification in "Transmission system for Integration of Power from RE Projects in Lakadia REZ in Gujarat-Phase II (7500 MW)" due to non-visibility of Green Hydrogen/ Ammonia demand in Kandla area.**

3.2.1 Representative of CTUIL stated that the transmission system for integration of power from RE Projects in Lakadia area in Gujarat for 7.5 GW capacity, namely *"Transmission system for Integration of Power from RE Projects in Lakadia REZ in Gujarat-Phase II (7500 MW)"* was recommended in the 37th NCT meeting held on 19.01.2026, with an implementation schedule of 36 Months with RECPDCL as BPC, with the condition that the implementation schedule may be reviewed prior to award based on the bidding status of the Transmission System for supply of power to Green Hydrogen/Ammonia manufacturing potential in Kandla area of Gujarat (Phase-I: 3 GW). The subject transmission scheme, inter-alia, includes establishment of 765/400 kV, 6x1500 MVA & 400/220 kV, 10x500 MVA Lakadia-II S/s (Near Chitrod), LILO of Halvad – Kandla 765 kV D/c line at Lakadia-II, Lakadia-II – Ahmedabad 765 kV D/c line, and Lakadia-II – Vataman 765 kV D/c line.

3.2.2 The BPC informed the following regarding the bidding status of the Transmission System for supply of power to Green Hydrogen/Ammonia manufacturing potential in Kandla area of Gujarat (Phase-I: 3 GW):

- Upon conclusion of the bidding process, LoI was issued to the successful bidder, M/s Reliance Industries Ltd. (RIL), on 19/02/2025.
- However, SPV transfer was kept on hold by BPC based on communication from MoP due to absence of GNA applications from Green Hydrogen/Green Ammonia developers.
- RIL, vide letter dated 18.02.2026, expressed inability to extend the validity of the bid and bid bond for the subject transmission scheme, citing delay of more than a year since submission of their techno-commercial offer, followed by e-reverse auction process.
- BEC meeting for re-initiating the bidding was held on 02.04.2026, however, bidding process remains on hold awaiting further direction from MoP.

3.2.3 CTUIL also informed that no Green Hydrogen/Ammonia application has been received in the Kandla area as on date. However, M/s L&T Energy GreenTech Ltd. (LTEGL), vide letter dated 13.04.2026 addressed to MoP, submitted the following:

- A Term Sheet has been signed with ITOCHU Corporation, Japan, for development of a 300 KTPA Green Ammonia project, expandable up to 1.8 MMTPA in six phases, at Kandla, catering to the marine sector.
- A project-specific SPV, L&T Green Energy Kandla Pvt. Ltd., has been incorporated, which shall, in due course, apply for GNA in line with the project requirements and commissioning schedule.
- Timely implementation of the Kandla Transmission System is essential for enabling scalable development of green hydrogen/ammonia projects.
- LTEGL has requested expediting completion of the bidding process, including SPV transfer, targeting power drawal by the end of CY 2029 and emphasized closure of tendering process by December 2026.

3.2.4 Representative of CTUIL proposed that deliberations are required on whether to re-initiate the bidding process for the Kandla Green Hydrogen Transmission Scheme (Phase-I: 3 GW) in absence of firm GNA applications.

It was further highlighted that the Lakadia REZ Phase II (7500 MW) transmission scheme, which is also under bidding, is dependent on the Kandla (Phase-I: 3 GW) scheme. In case establishment of Kandla 765/400 kV S/s and Halvad – Kandla 765 kV D/c line do not materialize, then instead of LILO of Halvad – Kandla 765 kV D/c line at Lakadia-II S/s (~22 km or 88 ckm), the following would be required:

- Lakadia-II – Halvad 765 kV D/c line (~140 km or 280 km) along with associated bays at both ends.
- 240 MVAr, 765 kV Switchable Line Reactors at Lakadia-II end of Lakadia-II – Halvad 765 kV D/c line.

3.2.5 Representative from MNRE indicated lack of visibility of Green Hydrogen projects in the Kandla area.

3.2.6 Representative of CTUIL stated that as there is no visibility of load, the transmission scheme for Kandla Transmission System may be reviewed.

3.2.7 Expert Member Sh. S.R. Narasimhan stated that it would require modification in the Transmission System for supply of power to Green Hydrogen/Ammonia manufacturing potential in Kandla area of Gujarat (Phase-I: 3 GW) scheme. He suggested that while approving the modification in the scheme for Kandla, the voltage level of substation may be seen depending upon the load requirement fructifying.

3.2.8 Regarding, Transmission scheme for Lakadia Ph-II, CTUIL informed that the future space provision for establishment of ± 800 kV, 6000 MW HVDC (LCC) terminal station at Lakadia-II along with associated interconnections with 400 kV HVAC Switchyard & all associated equipment (incl. filters)/bus extension, etc. may be deleted, as the HVDC requirement is under review and not envisaged currently. Based on the proposed modifications, the revised project cost is ₹8238 Crore, reflecting an increase of ₹732 Crore (~ 9.75%) over the earlier estimate of ₹7506 Crore.

3.2.9 After deliberations, NCT recommended the modification in the scheme *"Transmission system for Integration of Power from RE Projects in Lakadia REZ in Gujarat-Phase II (7500 MW)"* as detailed below:

	Original Scope		**Modified Scope**	
Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**	**Scope of the Transmission Scheme**	**Capacity /km**
1.	**Establishment of 765/400 kV, 6x1500 MVA & 10x500 MVA, 400/220 kV Lakadia-II (Near Chitrod)** with 2x330 MVAR 765 kV Bus reactor and	• 765/400 kV, 1500 MVA ICT – 6 Nos. (19x500 MVA single phase units including one spare ICT Unit) • 400/220 kV ICTs - 10 Nos. (5 on Sec-	**Establishment of 765/400 kV, 6x1500MVA & 10x500MVA, 400/220kV Lakadia-II (Near Chitrod)** with 2x330 MVAR 765kV Bus reactor	• 765/400 kV, 1500 MVA ICT – 6 Nos. (19x500 MVA single phase units including one spare ICT Unit) • 400/220 kV ICTs - 10 Nos. (5 on

	Original Scope		Modified Scope	
Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**	**Scope of the Transmission Scheme**	**Capacity /km**
	2x125 MVAR 400 kV Bus reactor. [765 kV, 400 kV & 220 kV levels to be established in two sections with Sectionaliser arrangement. The 220 kV Sectionaliser shall be kept normally open and may be closed under contingency conditions. The 400 kV and 765 kV Sectionaliser shall be kept normally closed. The bus operation may be reviewed after proposed HVDC implementation as per requirement of Grid operator. (3x1500MVA 765/400kV ICTs, 5x500MVA 400/220kV ICTs, 1x330MVAr 765kV BR & 1x125MVAr 420kV BR shall be on Sec-I & 3x1500MVA 765/400kV ICTs, 5x500MVA 400/220kV ICTs, 1x330MVAr 765kV BR & 1x125MVAr 420kV BR shall be on Sec-II)] **Future provision**	I & 5 on Sec-II) • 765 kV ICT bays – 6 Nos. • 400 kV ICT bays – 16 Nos. • 220kV ICT bays – 10 Nos. • 1x330 MVAr, 765 kV bus reactor- 2 Nos. (7x110 MVAR single phase Reactors including one spare Unit for bus /line reactor) (1 on Sec-I & 1 on Sec-II) • 765 kV Bus reactor bay – 2 Nos. • **765kV line bays: 8 nos. (4 Nos. on Sec-I (2 for Halvad D/c & 2 for Ahmedabad D/c) and 4 Nos. on Sec-II (2 for Kandla D/c and 2 for Vataman))** • 765 kV Sectionaliser bay: 1 -set • 400 kV Sectionaliser bay: 1- set • 220 kV Sectionaliser bay: 1- set • 220kV BC– 2 Nos. • 220kV TBC – 2 Nos. • 1x125 MVAr, 420 kV bus reactor- 2 Nos. (1 on Sec-I &	and 2x125 MVAR 400kV Bus reactor. [**765kV**, 400kV & 220kV levels to be established in two sections with Sectionaliser arrangement. The 220kV Sectionaliser shall be kept normally open and may be closed under contingency condition. The 400kV and 765kV Sectionaliser shall be kept normally closed. The bus operation may be reviewed after proposed HVDC implementation as per requirement of Grid operator. (3x1500MVA 765/400kV ICTs, 5x500MVA 400/220kV ICTs, 1x330MVAr 765kV BR & 1x125MVAr 420kV BR shall be on Sec-I & 3x1500MVA 765/400kV ICTs, 5x500MVA 400/220kV ICTs, 1x330MVAr 765kV BR & 1x125MVAr 420kV BR shall be on Sec-II)] **Future provision (space for):**	Sec-I & 5 on Sec-II) • 765 kV ICT bays – 6 Nos. • 400 kV ICT bays – 16 Nos. • 220kV ICT bays – 10 Nos. • 1x330 MVAr, 765 kV bus reactor- 2 Nos. (7x110 MVAR single phase Reactors including one spare Unit for bus /line reactor) (1 on Sec-I & 1 on Sec-II) • 765 kV Bus reactor bay – 2 Nos. • **765kV line bays: 6 nos. (4 Nos. on Sec-I (2 for Halvad D/c & 2 for Ahmedabad D/c) and 2 Nos. on Sec-II (for Vataman))** • 765 kV Sectionaliser bay: 1 -set • 400 kV Sectionaliser bay: 1- set • 220 kV Sectionaliser bay: 1- set • 220kV BC– 2 Nos. • 220kV TBC – 2 Nos. • 1x125 MVAr, 420 kV bus

	Original Scope		Modified Scope	
Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**	**Scope of the Transmission Scheme**	**Capacity /km**
	(space for): ➢ 765 kV line bays along with switchable line reactors **– 6 Nos. (2 Nos. on Sec-I & 4 Nos. on Sec-II)** ➢ 765 kV Bus Reactor along with bay: 2 Nos. (1 on Sec-I & 1 on Sec-II) ➢ 400 kV line bays along with switchable line reactors– 7 Nos. (3 on Sec-I & 4 on Sec-II) + **4 Nos. 400kV bays (2 nos. on each section) for HVDC Interconnection** ➢ 420 kV, 125MVAr Bus Reactor along with bays: 2 Nos. (1 on Sec-I & 1 on Sec-II) ➢ 220 kV line bays: 2 No. on Sec-I & 1 Nos. on Section-II ➢ **Establishment of 6000 MW, ± 800 kV Lakadia-II (HVDC) [LCC] terminal station (4x1500 MW) along with associated interconnections with 400 kV**	1 on Sec-II) • 400 kV Bus reactor bay- 2 Nos. • 400 kV line bays - 3 Nos. (2 nos. on Section-I & 1 No. on Sec-II for interconnection of RE Projects) • 220 kV line bays - 15 Nos. (7 nos. on Sec-I & 8 nos. on Sec-II for interconnection of RE Projects)	➢ 765 kV line bays along with switchable line reactors – **8 Nos. (2 Nos. on Sec-I & 6 Nos. on Sec-II)** ➢ 765 kV Bus Reactor along with bay: 2 Nos. (1 on Sec-I & 1 on Sec-II) ➢ 400 kV line bays along with switchable line reactors– 7 Nos. (3 on Sec-I & 4 on Sec-II) ➢ 420 kV, 125MVAr Bus Reactor along with bays: 2 Nos. (1 on Sec-I & 1 on Sec-II) ➢ 220 kV line bays: 2 No. on Sec-I & 1 Nos. on Section-II ➢ Synchronous Condenser (+300/-200MVAr) along with 400kV bay – 2 Nos. (1 on Sec-I & 1 on Sec-II)	reactor- 2 Nos. (1 on Sec-I & 1 on Sec-II) • 400 kV Bus reactor bay- 2 Nos. • 400 kV line bays - 3 Nos. (2 nos. on Section-I & 1 No. on Sec-II for interconnection of RE Projects) • 220 kV line bays - 15 Nos. (7 nos. on Sec-I & 8 nos. on Sec-II for interconnection of RE Projects)

	Original Scope		**Modified Scope**	
Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**	**Scope of the Transmission Scheme**	**Capacity /km**
	HVAC Switchyard & all associated equipment (incl. filters)/bus extension, etc. (2x1500MW poles on each 400kV section) ➢ Synchronous Condenser (+300/-200MVAr) along with 400kV bay – 2 Nos. (1 on Sec-I & 1 on Sec-II)			
2.	Installation of Synchronous Condenser (+300/-200MVAr) (Minimum) & Short circuit contribution at PCC of 1200 MVA (Minimum) at Lakadia-II – 2 Nos. Value of Inertia (Minimum) shall be 3000 MW-s	Synchronous Condenser along with associated 400kV bay-2 Nos. (one each on Sec-I & II)	Installation of Synchronous Condenser (+300/-200MVAr) (Minimum) & Short circuit contribution at PCC of 1200 MVA (Minimum) at Lakadia-II – 2 Nos. Value of Inertia (Minimum) shall be 3000 MW-s	Synchronous Condenser along with associated 400kV bay-2 Nos. (one each on Sec-I & II)
3.	LILO of Halvad – Kandla 765kV D/c line at Lakadia-II	LILO route length ~22km. (88ckm)	**Lakadia-II – Halvad 765kV D/c line**	**140 km. (280ckm)**
3a	-	-	**2 Nos. 765 kV line bays at Halvad S/s for Lakadia-II – Halvad 765kV D/c line**	**765 kV line bays – 2 Nos. (AIS)**
3b.	-	-	• **765 kV, 240 MVAr Switchable line reactors on Lakadia-II end of**	• **240 MVAr, 765 kV Switchable Line Reactor- 2 Nos. (2 for**

	Original Scope		**Modified Scope**	
Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**	**Scope of the Transmission Scheme**	**Capacity /km**
			Lakadia-II – Halvad 765 kV D/c line	**Lakadia-II end)** • **765 kV Switchable Line Reactor bay - 2 Nos. for Lakadia-II end** • **80 MVAr spare single-phase reactor at Lakadia-II as proposed under Sl. 9 for above 240 MVAr Switchable Line Reactor shall be utilized.**
4.	Lakadia-II – Ahmedabad 765kV D/c line	190 km (380 ckm)	Lakadia-II – Ahmedabad 765kV D/c line	190 km (380 ckm)
5.	2 Nos. 765 kV line bays at Ahmedabad S/s for Lakadia-II – Ahmedabad 765kV D/c line	765 kV line bays – 2 Nos. (AIS)	2 Nos. 765 kV line bays at Ahmedabad S/s for Lakadia-II – Ahmedabad 765kV D/c line	765 kV line bays – 2 Nos. (AIS)
6.	765kV, 330MVAr Switchable line reactors on each circuit at Ahmedabad end of Lakadia-II – Ahmedabad 765 kV D/c line	• 330 MVAr, 765 kV Switchable Line Reactor- 2 Nos. • 765 kV Switchable Line Reactor bay - 2 Nos. • 110MVAr spare single-phase reactor at Ahmedabad S/s is already available and same shall be used for subject Switchable Line Reactor.	765kV, 330MVAr Switchable line reactors on each circuit at Ahmedabad end of Lakadia-II – Ahmedabad 765kV D/c line	• 330 MVAr, 765 kV Switchable Line Reactor- 2 Nos. • 765 kV Switchable Line Reactor bay - 2 Nos. • 110 MVAr spare single-phase reactor at Ahmedabad S/s is already available and same shall be used for subject Switchable Line Reactor.
7.	Lakadia-II –	220 km (440 ckm)	Lakadia-II –	220 km (440 ckm)

	Original Scope		Modified Scope	
Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**	**Scope of the Transmission Scheme**	**Capacity /km**
	Vataman 765 kV D/c line (220 km.)		Vataman 765kV D/c line (220km.)	
8.	2 Nos. 765 kV line bays at Vataman S/s for Lakadia-II – Vataman 765 kV D/c line	765 kV line bays – 2 Nos. (AIS)	2 Nos. 765 kV line bays at Vataman S/s for Lakadia-II – Vataman 765kV D/c line	765 kV line bays – 2 Nos. (AIS)
9.	765 kV, 240 MVAr Switchable line reactors on each circuit at both ends of Lakadia-II – Vataman 765kV D/c line	• 240 MVAr, 765 kV Switchable Line Reactor - 4 Nos. (2 for Lakadia-II end and 2 for Vataman end) • 765 kV Switchable Line Reactor bay - 4 Nos (2 for Lakadia-II end and 2 for Vataman end) • 80 MVAr spare single-phase reactor at Lakadia-II for above 240 MVAr Switchable Line Reactor. • 80 MVAr spare single-phase reactor at Vataman S/s is already available and same shall be used for subject Switchable Line Reactor.	765 kV, 240 MVAr Switchable line reactors on each circuit at both ends of Lakadia-II – Vataman 765 kV D/c line	• 240 MVAr, 765 kV Switchable Line Reactor- 4 Nos. (2 for Lakadia-II end and 2 for Vataman end) • 765 kV Switchable Line Reactor bay - 4 Nos (2 for Lakadia-II end and 2 for Vataman end) • 80 MVAr spare single-phase reactor at Lakadia-II for above 240 MVAr Switchable Line Reactor. • 80 MVAr spare single-phase reactor at Vataman S/s is already available and same shall be used for subject Switchable Line Reactor.

3.3 **Modification in the transmission scheme "Transmission System for integration of Krishnagiri REZ Phase-I"**

3.3.1 Representative of CTUIL informed that the transmission system for integration of

Krishnagiri (Kurnool-V) REZ Phase-I was recommended for implementation in the 35th NCT meeting held on 19.11.2025. The scheme was agreed to be implemented in two parts (TBCB and RTM) with 30 months implementation schedule. The transmission system under TBCB route is presently under bidding with an estimated cost of Rs. 7627 Cr.

3.3.2 Further, a part of the transmission system was awarded to POWERGRID under RTM route vide NCT OM dated 09.12.2025 with 30 months implementation schedule.

3.3.3 Subsequently, the implementation schedule of transmission scheme "Transmission System for integration of Krishnagiri REZ Phase-I" under TBCB was modified from 30 months to 36 months in the 38th NCT meeting held 25.02.2026. However, the implementation schedule of the scheme under RTM could not be modified.

3.3.4 BPC (PFCCL) vide email dated 12.05.2026 informed to CTUIL that during the survey works of 765kV Krishnagiri – Raichur D/c line, it was found that the termination of 765kV Krishnagiri – Raichur D/c line at Raichur Gantry is not feasible due to technical constraints and following was informed:

- Proposed 765 kV Krishnagiri – Raichur line has to under cross the under construction 765 kV Raichur – Koppal line using Single Circuit Towers
- Approximate Horizontal angle of deviation on gantry is 20 Degree.
- PFCCL requested CTUIL to review the same in view of implementation aspects.

3.3.5 As per approved transmission scheme, for termination of Krishnagiri – Raichur 765 kV D/c at Raichur end, existing 240 MVAr bus reactors (2 nos.) were decided to be converted as Switchable Line Reactor and above mentioned line may be terminated in exiting bus reactors bay (no. 709 & 718). Due to this, the Krishnagiri – Raichur 765kV D/c line is to be bifurcated into two S/c near Raichur S/s so as to terminate in the existing bus reactor bays.

3.3.6 CTUIL mentioned that the matter was discussed with POWERGRID and informed that at Raichur end there is transmission line corridor constraint for termination of line at bay no. 709, however corridor is available to terminate 765 kV line at bay no. 718. Further, space is available adjacent to bay no. 718 for termination of another 765 kV circuit, however, the same requires extension of transmission line gantry adjacent to that of bay no. 718 through 765 kV 1-Ph GIS bus duct from bay no. 709. With the above arrangement line termination gantries of 765kV Krishnagiri – Raichur D/c line shall be adjacent to each other and Krishnagiri - Raichur D/c line can be terminated through D/c tower. This arrangement requires addition of 765 kV 1-Ph GIS bus duct (approx. 1130 mtrs) along with associated SF6 to Air Bushings.

3.3.7 Representative of CTUIL also informed that there will be cost implication of about Rs. 40 crs (variation of less than 5% from the original cost).

3.3.8 After deliberations, NCT approved the following modifications to be included in the scope of the scheme (recommended under TBCB) as detailed below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	765 kV Bay extension works at Raichur S/S	• 765 kV 1-Ph GIS bus duct (approx. 1130 mtrs) along with associated SF6 to Air Bushings and Line termination gantry (for bay no. 709)

3.3.9 Further, NCT approved the modification in the implementation schedule of the scheme under RTM to 36 months from 30 months.

4 New Transmission Schemes

4.1 Transmission scheme for evacuation of power as part of Rajasthan REZ Ph-IV (Part-6: 6GW) (Bikaner Complex) (Bikaner V: 6GW)

4.1.1 Representative of CTUIL stated that the scheme was deliberated in 39th NCT meeting held on 17.03.26 & 40th NCT meeting held on 15.04.26. In the NCT meetings, it was deliberated that Connectivity applications of 6GW on Bikaner-V S/s may be granted Connectivity during non-solar hours at the margins available in the Bikaner-I to Bikaner-IV PS instead of establishing additional pooling station at Bikaner-V. Developers may be given the choice for non-solar hour Connectivity to choose the substation based on their feasibility, subject to the condition that BESS must be included by the developers with the RE Generation. In the meeting, following were decided:

a) Another meeting may be convened by CEA, with RE developers who have been granted in-principal connectivity through Bikaner V transmission scheme.

b) CTUIL to analyze implication for the technical minimum requirement of coal stations as 55% instead of 40%.

c) The scheme may be objective wise segregated (scheme required for RE evacuation of Bikaner V PS and Grid strengthening purpose based on Grid-India feedback)

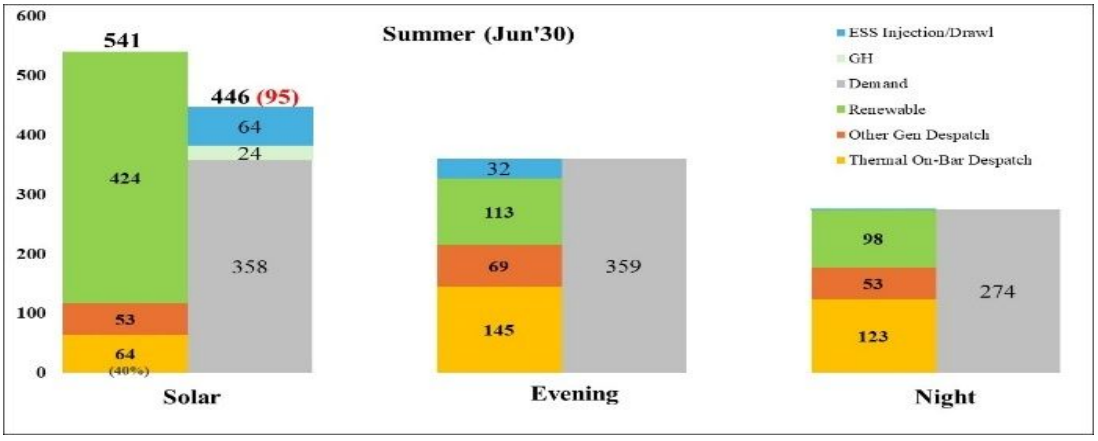
d) Studies need to be carried out to evaluate the Energy Storage option in lieu of transmission.

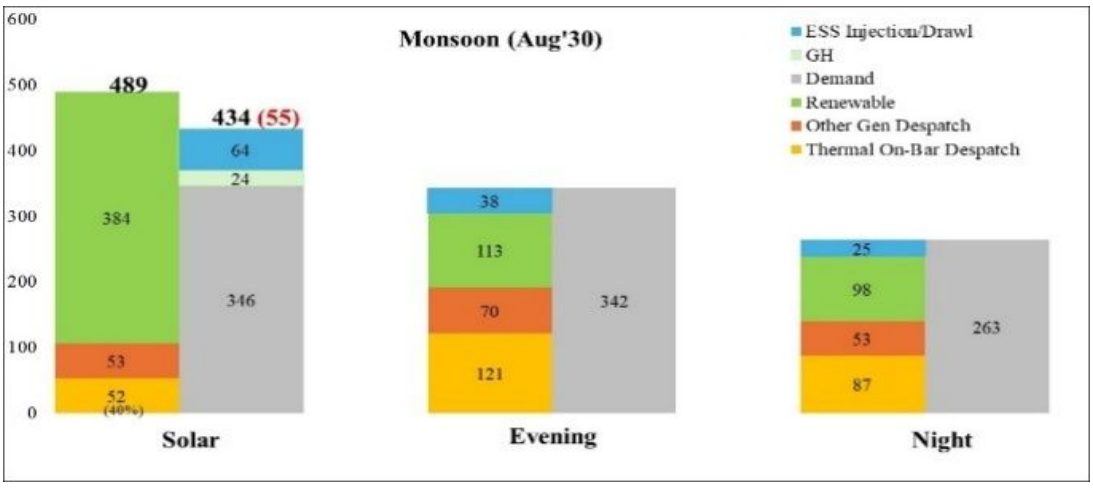
4.1.2 CTUIL mentioned that a meeting was held on 23.04.2026 under CEA, to deliberate upon and submissions made by the RE developers. During the meeting, it emerged that RE developers were not willing to shift to existing/under construction substations. In that meeting, Chairperson CEA requested the RE developers to have a rethinking on this and indicate their options to CTUIL so that the suitable connectivity can be granted. It was also indicated that at present there are curtailment in the grid and the RE developers may like to plan the capacity addition aligned with the requirements in the grid and also ensure their offtake.

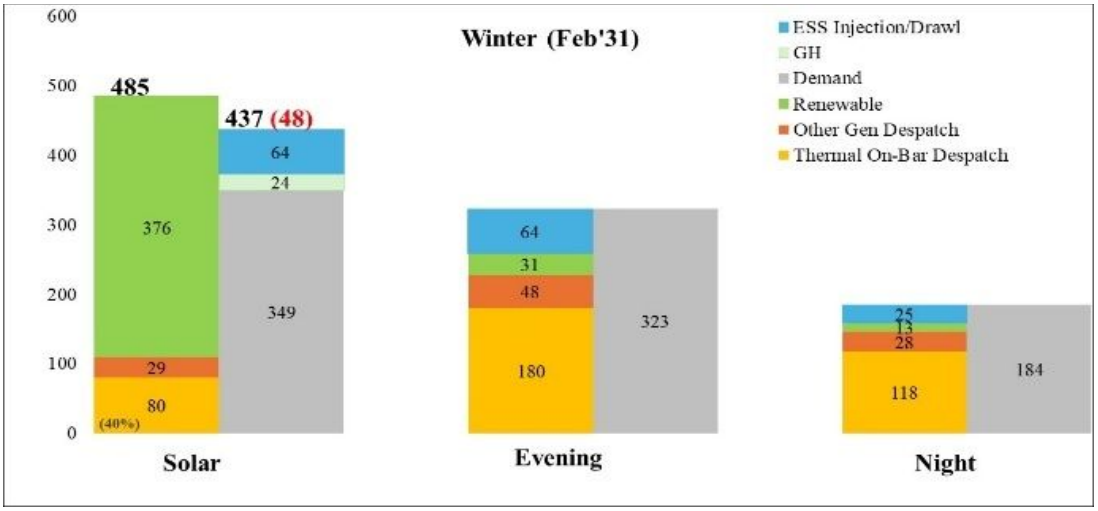
4.1.3 Joint Secretary, MNRE stated that the proposed Bikaner-V pooling station will be enabling the evacuation of approximately 12 GW of RE capacity (6 GW solar and 6 GW non-solar). MNRE has also sent a letter dated 07.04.2026 in this regard. He further mentioned that considering the significant financial investments on the infrastructure made by the developers based on in-principle connectivity grants, any reversal of this infrastructure roadmap at this stage would not only result in significant sunk costs but also adversely affect investor confidence in India's RE growth story.

4.1.4 Regarding implication of the technical minimum requirement of coal stations as 55% instead of 40%, CTUIL mentioned that load generation was prepared as part of the rolling plan for Year 2030-31. It was explained that during the Summer (Jun'30) – Solar max scenario total demand of 446 GW (358 GW+ 24 GW of Green Hydrogen/Ammonia + 64 GW of ESS drawal) have been considered. Further on generation side, minimum thermal generation of 61 GW (@40% of On-bar IC considering the technical minimum), Hydro & Nuclear - 53 GW, Solar and Wind – 424 GW have been considered. The observations under different scenarios are depicted below:

All figures are in GW







4.1.5 CTUIL mentioned that an absolute generation surplus of 95 GW has been observed in the Summer (Jun'30) – Solar max scenario. Similar load generation have been worked out for Monsson (Aug'30) and Winter (Feb'31) which leads to surplus of 55 GW and 48 GW respectively. From, it is observed that there will be surplus of about 48-95 GW across the seasons and dispatch scenarios requiring RE Curtailment even if there is no transmission constraints. In case, the technical minimum of thermal on bar installed capacity is considered 55% instead of 40%, the surplus is expected to increase to 68-115 GW.

4.1.6 Expert Member Sh. S.R. Narasimhan stated that the Load Generation Balance indicated by the CTU for the different 2030-31 scenarios indicated a surplus of 48-95 GW even with 40% technical minimum loading on thermal units. Also, this surplus is considering that during the high solar hours there would be 24 GW of additional load on account of green hydrogen and green ammonia and 64 GW charging of BESS and pumping actions at Pumped Storage Projects (PSPs). In case the technical minimum is increased to 55%, the surplus would further go up by 20 GW. Artificially correcting the LGB by reducing thermal to non-feasible levels in the transmission planning studies is not in order. This aspect is being highlighted since 2018-19 but ignored. Also there must be consistency between the Transmission Planning studies and Long Term-National Resource Adequacy Plan (LT-NRAP) by CEA.

He stated that the impact of loss of flexibility would be evident from the 2025-26 data when on 176 days (every 2nd day), the ISTS connected wind and solar had to be backed down through Tertiary Reserves Ancillary Service (TRAS). Nearly 2.7 BU of energy was curtailed through this route which corresponds to 2.5% annual curtailment. Very recently from 1st to 3rd May 2026 nearly 25 GW of ISTS connected RE was curtailed through TRAS down for a single 15-minute time block.

Apart from the above flexibility related curtailments, nearly 11 GW of wind and solar collectively across Rajasthan and Gujarat is curtailed over 90% due to delay in commissioning of the planned transmission system at ISTS level. Unfortunately in transmission planning studies, the risk of delays in commissioning is not factored. The

Short Circuit Ratio (SCR) related issues flagged by Grid-India also merited urgent attention. These issues also had been flagged in earlier years and is yet to be effectively addressed.

4.1.7 Regarding segregation of the scheme, CTUIL mentioned that the scheme shall facilitate evacuation of 6 GW RE power from Bikaner V PS as well as resolve the issue of critical loading (N-1 non-compliant) and higher angular separation of various existing 765kV and 400kV lines i.e. 765kV Bikaner-Moga D/c line, 765kV Aligarh-G.Noida line, 400kv Bikaner-II – Khetri D/c line. These EHVAC lines carrying huge RE power from Rajasthan RE complexes and with increasing RE integration in concentrated pockets, these lines facing N-1 non-compliance issue under various operational scenario (as per Grid-India operational feedback) and in near term planning horizon. The proposed Bikaner V transmission scheme was formulated considering LILO of above lines at new ISTS substations (proposed to be establish in Bikaner V scheme) and disperse about 3GW additional power through EHVAC network. The comprehensive scheme provides techno economic solution for evacuation of 6GW RE power from Bikaner V PS as well as to mitigate technical constraints in existing RE evacuation lines. CTUIL proposed segregation of the total scheme into the grid strengthening scheme required based on Grid-India operational feedback and the scheme required for RE integration & evacuation.

CTUIL mentioned that Part-A-Grid Strengthening scheme required based on Grid-India operational feedback - about 12,400 Cr (this shall also facilitate evacuation of power from Bikaner V PS) and Part-B-Transmission Scheme required explicitly for RE evacuation of Bikaner V PS (6 GW) - about 18,100 Cr

4.1.8 Representative of Grid-India stated that though some part of the scheme has been categorized under system strengthening, the GNA of the RE plants at Bikaner-V shall be linked with both – transmission system planned under Bikaner-V scheme as well as common system strengthening part also – as both would be required to facilitate generation evacuation from Bikaner-V.

4.1.9 Expert Member Sh. Narasimhan stated that artificial segregation between ‘evacuation scheme’ and ‘strengthening scheme’ seems out of place as sections within Uttar Pradesh were being treated as evacuation scheme while those in the immediate vicinity of the RE complex were treated as ‘Strengthening scheme’.

4.1.10 CTU stated that segregation of transmission elements required for Bikaner V evacuation and strengthening components were carried out based on system studies. Grid strengthening scheme in Rajasthan and Uttar Pradesh were identified based on Grid-India operational feedback to resolve the issue of critical loading (N-1 non-compliant) and higher angular separation of various existing 765kV and 400kV lines.

4.1.11 Members asked CTUIL, whether the evacuation part can evacuate full power from Bikaner-V. CTUIL stated that full system (evacuation system as well as system strengthening part) will be required for evacuation of 6 GW power from Bikaner V

PS.

4.1.12 CTUIL mentioned that the estimated cost of proposed scheme being about Rs. 31,200 Crs, it is segregated into four packages with an implementation timeframe of 36 months as mentioned below:

S. No.	Part of Scheme	Cost (Rs. Crore)
1.	Part A	6948.78
2.	Part B	8617.14
3.	Part C	8349.40
4.	Part D	7152.32
5.	Part E	129.41
Total		**31197.04**

4.1.13 Details of packages are as under:

(A). Transmission scheme for evacuation of power as part of Rajasthan REZ Ph-IV (Part-6: 6GW) (Bikaner Complex) (Bikaner V: 6GW)- Part A (Estimated cost: Rs. 6948.78 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, 6x1500 MVA & 400/220 kV, 10x500 MVA Bikaner-V Pooling Station along with 2x240 MVAr (765kV) & 2x125 MVAr (420kV) Bus Reactors at a suitable location near Bikaner **<u>Future provisions (excl. scope of present scheme):</u>** ➢ 765 kV line bays along with switchable line reactor –4 nos. ➢ 400 kV line bays along with switchable line reactor –4 nos. ➢ 400 kV line bays –4 Nos. ➢ 765 kV Bus Reactor along with bays: 1 No ➢ 400 kV Bus Reactor along with bays: 1 No. ➢ 400/220 kV ICT along with bays-2 Nos. ➢ 400 kV Sectionalization bays: 1 set ➢ 220 kV line bays for connectivity RE	**Bikaner-V PS - AIS** • 765/400 kV 1500 MVA ICTs- 6 Nos. (19x500 MVA including one spare unit) • 400/220 kV 500 MVA ICTs- 10 Nos. • 765kV line bays – 4 nos. (for 765kV interconnection with Pallu S/s) • 400kV line bays – 4 nos. (for 400kV interconnection with LILO of one D/c of 400kV Bikaner II PS- Khetri 2xD/c line) • 765kV ICT bays – 6 nos. • 400 kV ICT bays- 16 Nos. • 220 kV ICT bays - 10 Nos. • 240 MVAr Bus Reactor-2 Nos. (7x80 MVAr, including one spare unit) • 765 kV Bus reactor bays-2 Nos. • 125 MVAr Bus Reactor-2 Nos. • 400 kV Bus reactor bays- 2 Nos. • 400kV line bays– 3 Nos. (for RE interconnection) • 220kV line bays – 10 Nos. (for RE

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
	Applications -4 Nos. ➢ 220kV Sectionalization bay: 2 sets ➢ 220 kV BC (2 Nos.) & TBC (2 Nos.) ➢ 1 No. of Syncon units* at 400kV level along with 1 nos. of 400kV bay ***1 No. of SynCon unit comprises dynamic support of +300MVAr/-200MVAr (Minimum) & Short circuit contribution at PCC of 1200MVA (Minimum)) (Value of inertia (MW-secs) shall be provided in RfP document)***	interconnection) • 220kV Sectionalization bay: 1 set • 220 kV BC (2 Nos.) & TBC (2 Nos.) • 400kV sectionaliser bay- 1 Set
2	STATCOM (2x±300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr) at Bikaner-V PS	• STATCOM (2x+300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr) • 400 kV bays: 2 Nos. (for STATCOM)
3	LILO of one double ckt of 400kV Bikaner II PS- Khetri (Twin HTLS) 2xD/c line at Bikaner-V PS along with 50 MVAr switchable line reactor for each circuit at Bikaner-V PS end of 400kV Bikaner-V-Khetri section	Length-28km (Quad) (LILO length) • 420 kV, 50 MVAr switchable line reactors at Bikaner-V PS end – 2 Nos. • Switching equipment for 420kV, 50MVAr switchable line reactors at Bikaner-V PS end – 2 Nos.
4	Establishment of 765/400 kV, 2x1500 MVA S/s at suitable location near Pallu (Distt. Hanumangarh) along with 2x240 MVAr (765kV) & 2x125 MVAr (420kV) Bus Reactors **<u>Future provisions (excl. scope of present scheme):</u>** ➢ 765 kV line bays along with switchable line reactor –2 nos. ➢ 765/400 kV 1500 MVA ICTs- 2 Nos. ➢ 400 kV line bays along with switchable line reactor –4 nos.	**Pallu S/s - AIS** • 765/400 kV 1500 MVA ICTs- 2 Nos. (7x500 MVA including one spare unit) • 765kV line bays – 12 nos. (for 765kV 2xD/c interconnection each with Bikaner-V PS, Panipat S/s and LILO of both ckts of 765kV Bikaner – Moga D/c line) • 400kV line bays – 2 nos. (for 400kV interconnection with Hanumangarh S/s) • 765kV ICT bays – 2 nos.

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
	➢ 400 kV line bays –4 Nos. ➢ 765 kV Bus Reactor along with bays: 1 No ➢ 400 kV Bus Reactor along with bays: 1 No. ➢ 400 kV Sectionalization bays: 1 set ➢ 400/220 kV ICT along with bays-5 Nos. ➢ 220 kV line bays -8 Nos. ➢ 220kV Sectionalization bay: 1 set ➢ 220 kV BC (2 Nos.) & TBC (2 Nos.) ➢ 2 No. of Syncon units* at 220kV level along with 2 nos. of 220kV bay ***1 No. of SynCon unit comprises dynamic support of +300MVAr/-200MVAr (Minimum) & Short circuit contribution at PCC of 1200MVA (Minimum)) (Value of inertia (MW-secs) shall be provided in RfP document)*	• 400 kV ICT bays- 2 Nos. • 240 MVAr Bus Reactor-2 Nos. (7x80 MVAr, including one spare unit) • 765 kV Bus reactor bays-2 Nos. • 125 MVAr Bus Reactor-2 Nos. • 400 kV Bus reactor bays- 2 Nos.
5	765 kV Bikaner-V PS – Pallu 2xD/c line	Line Length -135 km
6	LILO of both ckts of 765kV Bikaner – Moga D/c line at Pallu S/s along with 240MVAr switchable line reactor for each circuit at Pallu S/s end of 765kV Pallu-Moga D/c line	Length-10 km (LILO length) • 765 kV, 240 MVAr switchable line reactors at Pallu S/s end– 2 Nos. • Switching equipment for 765kV, 240MVAr switchable line reactors at Pallu S/s end – 2 Nos.
7	400 kV Pallu – Hanumangarh (RVPN) D/c (Quad) line	Line Length -92 km • 400kV line bays – 2 nos. (at Hanumangarh (RVPN) S/s)

(B). Transmission scheme for evacuation of power as part of Rajasthan REZ Ph-IV (Part-6: 6GW) (Bikaner Complex) (Bikaner V: 6GW) – Part B (Estimated cost: Rs. 8617.14 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, 3x1500 MVA S/s at suitable location near Panipat (Distt. Panipat) along with 2x240 MVAr (765kV) & 2x125 MVAr (420kV) Bus Reactors **<u>Future provisions (excl. scope of present scheme):</u>** ➢ 765 kV line bays along with switchable line reactor –4 nos. ➢ 765/400 kV 1500 MVA ICTs- 3 Nos. ➢ 400 kV line bays along with switchable line reactor –4 nos. ➢ 400 kV line bays –4 Nos. ➢ 765 kV Bus Reactor along with bays: 1 No ➢ 400 kV Bus Reactor along with bays: 1 No. ➢ 400 kV Sectionalization bays: 1 set ➢ 400/220 kV ICT along with bays-5 Nos. ➢ 220 kV line bays -8 Nos. ➢ 220kV Sectionalization bay: 1 set ➢ 220 kV BC (2 Nos.) ➢ STATCOM (2x±300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr) along with 400kv bays (2nos.)	**Panipat S/s - GIS** • 765/400 kV 1500 MVA ICTs- 3 Nos. (10x500 MVA including one spare unit) • 765kV line bays –8 nos. (for 765kV 2xD/c interconnection each with Pallu S/s and Bulandshahr S/s) • 400kV line bays – 4 nos. (for 400kV interconnection with Mohali and Mandola S/s) • 765kV ICT bays – 3 nos. • 400 kV ICT bays- 3 Nos. • 240 MVAr Bus Reactor-2 Nos. (7x80 MVAr, including one spare unit) • 765 kV Bus reactor bays-2 Nos. • 125 MVAr Bus Reactor-2 Nos. • 400 kV Bus reactor bays- 2 Nos.
2	765 kV Pallu-Panipat 2xD/c line along with 240 MVAr switchable line reactor for each circuit at each end	Length-260 km • 765 kV, 240 MVAr switchable line reactors at Pallu S/s end– 4 Nos. • 765 kV, 240 MVAr switchable line reactors at Panipat S/s end– 4 Nos. • Switching equipment for 765kV, 240MVAr switchable line reactors at Pallu S/s end – 4 Nos. • Switching equipment for 765kV,

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
		240MVAr switchable line reactors at Panipat S/s end – 4 Nos.
3	Establishment of 400/220kV, 4x500 MVA S/s at suitable location near Mohali (Distt. Mohali district) along with 2x125 MVAr (420kV) Bus Reactors **<u>Future provisions (excl. scope of present scheme):</u>** ➢ 400 kV line bays along with switchable line reactor –4 nos. ➢ 400 kV line bays –2 Nos. ➢ 400 kV Bus Reactor along with bays: 1 No. ➢ 400/220 kV ICT along with bays-1 Nos. ➢ 400 kV Sectionalization bays: 1 set ➢ 220 kV line bays -4 Nos. ➢ 220kV Sectionalization bay: 1 set ➢ 220 kV BC (1 Nos.) ➢ STATCOM (2x±300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr) along with 400kv bays (2nos.)	**Mohali S/s - GIS** • 400kV line bays – 4 nos. (for 400kV interconnection with Panipat S/s & LILO of one circuit of 400kV Patiala-Panchkula D/c line) • 400/220kV ICTs – 4 nos. • 400kV ICT bays – 4 nos. • 220 kV ICT bays- 4 Nos. • 125 MVAr Bus Reactor-2 Nos. • 400 kV Bus reactor bays- 2 Nos. • 220 kV line bays -6 Nos. • 220kV Bus Coupler bay-1 No. ***400/220 ICTs and 220kV line bays are implemented to meet PSTCL drawl requirement***
4	LILO of one circuit of 400kV Patiala-Panchkula D/c line at Mohali (Twin HTLS*) * ***with minimum capacity of 2100 MVA on each circuit at Nominal voltage***	Length-20 km (LILO length) (Twin HTLS)
5	400 kV Panipat S/s – Mohali D/c (Quad Moose) line along with 80 MVAr (420kV) switchable line reactor for each circuit at Mohali end	Line Length-160km (Quad) • 420 kV, 80 MVAr switchable line reactors at Mohali S/s end– 2 Nos. • Switching equipment for 420kV, 80MVAr switchable line reactors at Mohali S/s end – 2 Nos.
6	400 kV Panipat S/s – Mandola D/c	Line Length-70km (Quad)

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
	(Quad) line	• 400kV line bays at Mandola S/s – 2 nos.

(C). **Transmission scheme for evacuation of power as part of Rajasthan REZ Ph-IV (Part-6: 6GW) (Bikaner Complex) (Bikaner V: 6GW) – Part C (Estimated cost: Rs. 8349.40 Cr.)**

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
1	Establishment of 765 kV S/s at suitable location near Bulandshahr (Distt. Bulandshahr) along with 2x330 MVAr (765kV) Bus Reactors **<u>Future provisions (excl. scope of present scheme):</u>** ➢ 765 kV line bays along with switchable line reactor –4 nos. ➢ 765/400 kV 1500 MVA ICTs- 4 Nos. ➢ 400 kV line bays along with switchable line reactor –4 nos. ➢ 400 kV line bays –4 Nos. ➢ 765 kV Bus Reactor along with bays: 1 No ➢ 400 kV Bus Reactor along with bays: 1 No. ➢ 400 kV Sectionalization bays: 1 set ➢ 400/220 kV ICT along with bays-5 Nos. ➢ 220 kV line bays -8 Nos. ➢ 220kV Sectionalization bay: 1 set ➢ 220 kV BC (2 Nos.) & TBC (2 nos.) ➢ STATCOM (2x±300MVAr) along with MSC (4x125 MVAr) & MSR (2x125 MVAr) along with 400kv bays	**Bulandshahr S/s – AIS** • 765kV line bays –10 nos. (for 765kV 2xD/c interconnection with Panipat S/s, 765kV D/c interconnection with Lucknow-II S/s & Noida sec-148 (UPPTCL) S/s and LILO of 765kV Aligarh – Gr. Noida line) • 330 MVAr Bus Reactor-2 Nos. (7x110 MVAr, including one spare unit) • 765 kV Bus reactor bays-2 Nos.

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
	(2nos.)	
2	765 kV Panipat- Bulandshahr 2xD/c line along with 240 MVAr switchable line reactor for each circuit at Bulandshahr end	Line Length-155 km • 765 kV, 240 MVAr switchable line reactors at Bulandshahr S/s end– 4 Nos. • Switching equipment for 765kV, 240MVAr switchable line reactors at Bulandshahr S/s end – 4 Nos. • 1x80 MVAr, 765kv reactor spare unit
3	LILO of 765kV Aligarh – Gr. Noida line at Bulandshahr S/s	Length-35 km (LILO length)
4	765kV Bulandshahr - Noida sec-148 (UPPTCL) D/c line	Line Length- 65 km • 765kV line bays (GIS) at Noida sec-148 S/s(UPPTCL) – 4 nos. (incl. 2 bays for dia completion).
5	Establishment of 765/400 kV, 2x1500 MVA Lucknow-II S/s at suitable location near Lucknow along with 2x330 MVAr (765kV) & 2x125 MVAr (420kV) Bus Reactors **Future provisions (excl. scope of present scheme):** ➢ 765 kV line bays along with switchable line reactor –8 nos. ➢ 765/400 kV 1500 MVA ICTs- 4 Nos. ➢ 400 kV line bays along with switchable line reactor –4 nos. ➢ 400 kV line bays –4 Nos. ➢ 765 kV Bus Reactor along with bays: 1 No ➢ 400 kV Bus Reactor along with bays: 1 No.	Lucknow-II S/s – AIS • 765/400 kV 1500 MVA ICTs- 2 Nos. (7x500 MVA including one spare unit) • 765kV line bays –4 nos. (for 765kV D/c interconnection each with Asana & Bulandshahr S/s) • 400kV line bays – 2 nos. (for 400kV interconnection with Gonda (UPPTCL) S/s) • 765kV ICT bays – 2 nos. • 400 kV ICT bays- 2 Nos. • 330 MVAr Bus Reactor-2 Nos. (7x110 MVAr, including one spare unit) • 765 kV Bus reactor bays-2 Nos. • 125 MVAr Bus Reactor-2 Nos. • 400 kV Bus reactor bays- 2 Nos.

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
	➢ 400 kV Sectionalization bays: 1 set ➢ 400/220 kV ICT along with bays-5 Nos. ➢ 220 kV line bays -8 Nos. ➢ 220kV Sectionalization bay: 1 set ➢ 220 kV BC (2 Nos.) & TBC (2 nos.) ➢ 2 No. of Syncon units* at 400kV level along with 2 nos. of 400kV bays *****1 No. of SynCon unit comprises dynamic support of +300MVAr/-200MVAr (Minimum) & Short circuit contribution at PCC of 1200MVA (Minimum)) (Value of inertia (MW-secs) shall be provided in RfP document)	
6	765 kV Bulandshahr – Lucknow-II D/c line along with 330 MVAr switchable line reactor for each circuit at each end	Line Length- 330km • 765 kV, 330 MVAr switchable line reactors at Bulandshahr S/s end– 2 Nos. • Switching equipment for 765kV, 330MVAr switchable line reactors at Bulandshahr S/s end – 2 Nos. • 765 kV, 330 MVAr switchable line reactors at Lucknow-II S/s end– 2 Nos. • Switching equipment for 765kV, 330MVAr switchable line reactors at Lucknow-II S/s end – 2 Nos.

(D). Transmission scheme for evacuation of power as part of Rajasthan REZ Ph-IV (Part-6: 6GW) (Bikaner Complex) (Bikaner V: 6GW) – Part D (Estimated cost: Rs. 7152.32 Cr.)

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
1	400 kV Lucknow-II – Gonda D/c (Quad Moose) line	Line Length- 150km • 400kV line bays at Gonda S/s (AIS) (UPPTCL) – 2 nos.
2	Establishment of 765/400 kV, 2x1500 MVA S/s at suitable location near Asana Village (Chandauli District) along with 2x330 MVAr (765kV) & 2x125 MVAr (420kV) Bus Reactors **<u>Future provisions (excl. scope of present scheme):</u>** ➢ 765 kV line bays along with switchable line reactor –6 nos. ➢ 765/400 kV 1500 MVA ICTs- 4 Nos. ➢ 400 kV line bays along with switchable line reactor –4 nos. ➢ 400 kV line bays –4 Nos. ➢ 765 kV Bus Reactor along with bays: 1 No ➢ 400 kV Bus Reactor along with bays: 1 No. ➢ 400 kV Sectionalization bays: 1 set ➢ 400/220 kV ICT along with bays-5 Nos. ➢ 220 kV line bays -8 Nos. ➢ 220kV Sectionalization bay: 1 set ➢ 220 kV BC (2 Nos.) & TBC (2 nos.) ➢ 2 No. of Syncon units* at 400kV level along with 2 nos. of 400kV bays **1 No. of SynCon unit comprises dynamic support of +300MVAr/-200MVAr (Minimum) & Short circuit contribution at PCC of 1200MVA (Minimum)) (Value of inertia (MW-secs) shall be provided in RfP document)*	**Asana (Chandauli) S/s – AIS** • 765/400 kV 1500 MVA ICTs- 2 Nos. (7x500 MVA including one spare unit) • 765kV line bays –4 nos. (for 765kV D/c interconnection each with Lucknow-II S/s & Nawada) • 400kV line bays – 4 nos. (for LILO of both ckts of 400kV Varanasi – Biharsharif D/c line) • 765kV ICT bays – 2 nos. • 400 kV ICT bays- 2 Nos. • 330 MVAr Bus Reactor-2 Nos. (7x110 MVAr, including one spare unit) • 765 kV Bus reactor bays-2 Nos. • 125 MVAr Bus Reactor-2 Nos. • 400 kV Bus reactor bays- 2 Nos.

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
3	765 kV Lucknow-II-Asana D/c line along with 330 MVAr switchable line reactor for each circuit at each end	Line Length- 350km • 765 kV, 330 MVAr switchable line reactors at Asana S/s end– 2 Nos. • Switching equipment for 765kV, 330MVAr switchable line reactors at Asana S/s end – 2 Nos. • 765 kV, 330 MVAr switchable line reactors at Lucknow-II S/s end– 2 Nos. • Switching equipment for 765kV, 330MVAr switchable line reactors at Lucknow-II S/s end – 2 Nos.
4	LILO of both ckts of 400kV Varanasi – Biharsharif D/c line at Asana S/s along with 80 MVAr switchable line reactor for each circuit at Asana end of 400kV Asana- Biharsharif section	Length-35km (LILO length) • 420 kV, 80 MVAr switchable line reactors at Asana S/s end– 2 Nos. • Switching equipment for 420kV, 80MVAr switchable line reactors at Asana S/s end – 2 Nos.
5	Asana – Nawada 765kV D/c line along with 330MVAr switchable line reactors in each circuits at Asana end	Line Length - 215km • 765KV line bays at Nawada S/s (AIS) – 2 nos. • 765 kV, 330 MVAr switchable line reactors at Asana S/s end– 2 Nos. • Switching equipment for 765kV, 330MVAr switchable line reactors at Asana S/s end – 2 Nos.

(E). Transmission scheme for evacuation of power as part of Rajasthan REZ Ph-IV (Part-6: 6GW) (Bikaner Complex) (Bikaner V: 6GW) – Part E (Estimated cost: Rs. 129.41 Cr.)

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
1	Reconductoring of 400kV Patiala – Mohali section (upto LILO point) with twin HTLS line * along with 400kV Bay	Line Length-30km • 400kV Bay upgradation at Patiala

Sl. No.	Description of Transmission Element	Scope of work (Type of Substation/Conductor capacity/km/no. of bays etc.)
	upgradation at Patiala S/s(AIS) end of 400kV Patiala – Mohali section commensurate to line rating (2100MVA) * ***with minimum capacity of 2100 MVA on each circuit at Nominal voltage***	S/s(AIS) end commensurate to line rating (2100MVA)

4.1.14 Representative of GRID-INDIA stated that at present, system strength / SCR in Rajasthan, Khavda and Pachora RE complex is on the lower side. Low frequency oscillations possibly due to low SCR are being observed in these RE complexes on a regular basis. The correlation of oscillations with low SCR was established during outage of 400 kV Bikaner – Bikaner-II D/c line and 400 kV Pachora – Bhopal line in recent months. Therefore, measures for improving SCR in Bikaner area also need to be implemented in this scheme.

4.1.15 Members observed that CTUIL has planned a transmission system for evacuation of 6 GW power at an estimated cost of Rs. 31,197.04 crores, which translates to more than Rs. 5 crore/MW which is on much higher side as compared to other transmission systems planned in the country.

4.1.16 Expert Member Sh. S.R. Narasimhan reiterated that his evaluation of Battery Energy Storage System (BESS) alternative to transmission as provided by him in the 39th meeting of NCT need to be examined. Mentioning the planning of RE addition with huge surplus scenario and artificially lowering thermal generation in studies, he expressed his reservations on agreeing to the proposal.

4.1.17 During the discussion, divergent views of the Members had emerged, which can briefly be categorized as under:

(i) As per CTUIL, there is likely to be surplus RE capacity of 48 – 95 GW in the time frame of 2030-31 during solar hours. However, if the flexible operation of coal-based power plants is considered as 55% instead of 40%, surplus RE capacity will increase by 20 GW, i.e. 68 – 115 GW.

(ii) The suggestion of bifurcation of scheme between strengthening and evacuation were not found to be justified, as it emerged that the entire system is required for evacuation of 6 GW of RE.

(iii) As per MNRE, the proposed Bikaner-V pooling station will be enabling the evacuation of approximately 12 GW of RE capacity (6 GW solar and 6 GW non-solar).

(iv) The Expert Member of NCT, pointed out the issue regarding RE surplus, its curtailment and low short-circuit ratio, and suggested for installation of BESS.

(v) Grid-India also raised concerns about depleting short-circuit ratio and the challenges in the grid, particularly in Rajasthan and Gujarat.

4.1.18 Considering the views of the members, following are recommended:

(i) The entire scheme, with an estimated cost of about Rs.31,200 Crores, may be considered in five packages i.e. Part-A to Part-E at mentioned at para 4.1.12 with details at para 4.1.13. Out of these, Part-A to Part-D can be considered under TBCB through RECPDCL as the BPC. The Part-E may be considered under RTM by POWERGRID.

(ii) Total connectivity for 12 GW of RE & Storage (6 GW solar and 6 GW non-solar hrs) shall be granted at Bikaner-V pooling station. Initially, connectivity for 3 GW may be granted for solar hours and 3 GW for non-solar hours to ESS with installation of commensurate RE. Subsequently additional connectivity may also be granted for 3 GW of RE for solar hours and 3 GW for non-solar hours to ESS with installation of commensurate RE.

(iii) Firm connectivity may be given to applications with PPA/LOA. For the applications with the BG and Land BG route, firm connectivity may be given only after submission of PPA/LOA. In case any applicant wants to continue under merchant route, an undertaking shall be taken from ESS applicants for installation of commensurate RE within a maximum period of 3 years.

(iv) Since Rajasthan has a potential of 12 GW of Hydro Pumped Power storage, an integrated transmission plan considering RE and PSPs needs to be taken up urgently. This is expected to take care of concerned curtailment.

(v) All the RE developers will be required to put grid forming inverters for 100% capacity along with BESS and at least 25% of the capacity with RE Plants to address the issue of low short-circuit ratio.

(vi) CTUIL shall only grant firm connectivity after the transfer of SPV to successful bidder for the transmission scheme.

(vii) The above solution is expected to address the various concerns which have been raised under para 4.1.17.

(viii) Another low cost option could be connecting 6 GW RE being planned at Bikaner-V at existing/under implementation Bikaner-I, II, II and IV substations with non-solar hour connectivity. However, no RE generator has given their consent for this option. Non solar hour connectivity at these substations Bikaner-I, II, II and IV substations need to be judiciously given so as to maximise the use of transmission system.

4.2 **Transmission System Strengthening at Karur PS for integration of RE generation**

capacity

4.2.1 Representative of CTUIL stated that Karur REZ (2.5 GW) was identified as a part of 18.5 GW RE potential in SR. Karur PS has been implemented by M/s Adani through LILO of Pugalur (HVDC) – Pugalur (existing) 400kV (Quad) D/c line at Karur PS and presently is under operation with 2x500 MVA, 400/230kV ICTs. Further, the pooling station is being augmented with 2x500 MVA, 400/230kV ICTs (3rd & 4th) and expected by Oct'26. Connectivity of about 1489 MW has been granted at Karur PS with above system.

4.2.2 He further added, additional Connectivity applications of about 687 MW has been received at Karur PS. With this, the total connectivity granted / agreed for grant / received shall be about 2176 MW. For grant of additional connectivity, augmentation of 2x500 MVA, 400/230kV ICTs (5th & 6th) and strengthening of transmission system beyond Karur PS is required. Further, SRLDC in various forums and in its operational feedback has highlighted the high loading on Karur PS – Pugalur (HVDC) 400kV (Quad) D/c line and Karur PS – Pugalur (existing) 400kV (Quad) D/c lines under N-1 conditions.

4.2.3 Following transmission system was proposed for grant of connectivity to the additional applications:

- Augmentation of 2x500 MVA, 400/230kV ICTs (5th & 6th) at Karur PS
- Karur PS – Pugalur (HVDC) 400kV (Quad) 2nd D/c line (~15 km)
- Karur PS – Pugalur (existing) 400kV (Quad) 2nd D/c line (~36 km)

4.2.4 Representative of CTUIL informed that, the above system shall also facilitate in enhancement of the reverse capability of Raigarh – Pugalur HVDC from 3000 MW to 6000 MW and connectivity has been granted to M/s Subramaniyapuram Wind Park Pvt. Ltd. for 350 MW with implementation of 230 kV terminal line bay at Karur PS under the scope of ISTS.

4.2.5 SRPC vide letter dated 08.04.2026 recommended the scheme for implementation and mentioned that same may be included in National component.

4.2.6 It was also mentioned that implementation of scheme require, acquisition of additional land at Pugalur (existing) for 2 nos. of 400kV line bays for Karur PS – Pugalur (existing) 400kV (Quad) 2nd D/c line and its integration with existing S/s, implementation of 2 nos. new GIS diameter (without future provision of line reactor) at Pugalur (HVDC) at Pugalur (HVDC) for Karur PS – Pugalur (HVDC) 400kV (Quad) 2nd D/c line and suitable re-routing of existing 400 kV lines including implementation of multi circuit tower etc. at Pugalur (HVDC) end.

4.2.7 After detailed deliberations, NCT advised CTUIL to study the scheme holistically matching with the Resource Adequacy plan. Further, NCT advised CTUIL to bring the scheme clearly indicating that the scheme is proposed for system strengthening or evacuation scheme.

4.3 ERES-48: Jeerat – Rajarhat – Subhasgram reconductoring

4.3.1 Representative of CTUIL stated that in the state of West Bengal, demand of power as well as load growth of the North 24 Parganas & South 24 Parganas Districts including Kolkata are maximum compared to other districts. There are four main sources of power supply viz. New Jeerat 765/400 kV S/s [POWERGRID], Jeerat 400/220 kV S/s [WBSETCL], and Subhasgram 400/220 kV S/s [POWERGRID] and Rajarhat 400/200 kV S/s [POWERGRID]. 5th 400/220kV, 315MVA ICT at Jeerat (WBSETCL), and 3rd 400/220kV, 500MVA ICT at Rajarhat (POWERGRID) are under implementation. Upon Commissioning of these ICTs, the total transformation capacity at these substations would become 5x315MVA at Jeerat (WBSETCL), 4x315+3x500MVA at Subhasgram (POWERGRID) and 3x500MVA at Rajarhat (POWERGRID). These EHV sub-stations are catering power to the various 220kV and 132kV substations in and around areas of Kolkata. In future timeframe, there is no N-1 contingency compliance for these lines and in case of outage of any of these lines, the remaining line is observed to be critically loaded beyond its thermal limit.

4.3.2 Besides, a substantial amount of load to the tune of 200-300MVA for data centers have been recently projected by WBSEDCL in and around New Town and Rajarhat areas with a 24x7 load characteristics throughout the years. Hence, considering the present and future load of these areas, for reliable operation of the grid in compliance with N-1 contingency, one 400kV system has been contemplated by WBSETCL by upgrading existing New Town AA-III 220/132kV S/s of WBSETCL to 400/220/132kV S/s through 2x500 MVA ICTs. The connection of the proposed NT AA-III 400/220/132 kV S/s to ISTS is proposed through LILO of Jeerat – Subhasgram 400kV S/c line.

4.3.3 He further informed that the matter was deliberated in the joint study meeting held on 25-09-2025 wherein from the studies for Peak Solar and Peak Demand scenarios of 2029-30 timeframe, it was observed that Jeerat (WBSETCL) – New Town AA3 400kV line and Jeerat (WBSETCL) – Rajarhat 400kV S/c lines are getting critically loaded under N-1 contingency. The said line sections are a part of Farakka – Jeerat 400kV 2xS/c line, commissioned way back in 1986 and 1994 respectively. Accordingly, considering the age of the line, RoW challenges, and the criticality of these lines to feed the capital city of West Bengal, it was proposed that the entire line section viz. Jeerat (WBSETCL) – Subhasgram (POWERGRID) and Jeerat (WBSETCL) – Rajarhat (POWERGRID) – Subhasgram (POWERGRID) 400kV lines may be reconductored with HTLS conductor in order to cater to increased power demand of the Kolkata and adjoining areas. Further, WBSETCL vide email dated 10-10-2025 had informed that the intra-state works (i.e. upgradation of New Town AA-III 220/132kV S/s of WBSETCL to 400/220/132kV S/s) is expected to be awarded by Mar 2026 with a completion schedule of 02 years from the Date of LoA. WBSETCL vide email dated 30-04-2026 has revised the expected commissioning schedule to Mar 2029.

4.3.4 After detailed deliberations, NCT approved the transmission scheme “ERES-48: Jeerat – Rajarhat – Subhasgram reconductoring” under RTM mode with following

details:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crore)	Remarks
I.	ERES-48: Jeerat – Rajarhat – Subhasgram reconductoring **Implementation timeframe:** 30 months	Rs. 211.79 crore	Under RTM through POWERGRID

4.3.5 Details of the scheme are given below:

Sl. No.	Scope of works	Capacity (MVA) / Line length (km)/ Nos.
1.	Reconductoring of Jeerat (WBSETCL) – Rajarhat (POWERGRID) 400kV S/c line (Twin ACSR Moose) line with Twin HTLS conductor (with ampacity of single HTLS as 1516A)	41ckm
2.	Reconductoring of Jeerat (WBSETCL) – Subhasgram (POWERGRID) 400kV S/c line (Twin ACSR Moose) line with Twin HTLS conductor (with ampacity of single HTLS as 1516A)	65ckm
3.	Reconductoring of Rajarhat (POWERGRID) – Subhasgram (POWERGRID) 400kV S/c line (Twin ACSR Moose) line with Twin HTLS conductor (with ampacity of single HTLS as 1516A)	34ckm
4.	Upgradation of 400kV bay equipment at **Jeerat (WBSETCL)** S/s	Suitable upgradation of 400kV line bays to commensurate the ampacity of HTLS -01 No.
5.	Upgradation of 400kV bay equipment at **Rajarhat (POWERGRID)** S/s	Suitable upgradation of 400kV line bays to commensurate the ampacity of HTLS -02 Nos.
6.	Upgradation of 400kV bay equipment at **Subhasgram (POWERGRID)** S/s	Suitable upgradation of 400kV line bays to commensurate the ampacity of HTLS -02 Nos. complete diameter

Note:

(a) WBSETCL to provide unconditional access to the ISTS licensee free of any costs for upgradation of identified bay equipment at Jeerat (WBSETCL) S/s.

(b) WBSETCL shall implement the upgradation of associated equipment of TBC at Jeerat

(WBSETCL) S/s commensurate with the rating of the HTLS lines (2x1516A) in matching timeframe.

4.4 NERGS-II: Dibang Basin

4.4.1 Representative of CTUIL stated that NHPC limited has applied for ISTS Connectivity of 2880MW for its Dibang Hydro Electric Project in Arunachal Pradesh. A Master Plan Report for power evacuation from potential HEPs in Brahmaputra basin was published by CEA in October 2025, wherein transmission systems for various HEPs in Brahmaputra basin including Dibang HEP have been identified. The augmentation in ISTS have been envisaged in the said report to be implemented as common transmission system to evacuate power of HEPs in the Brahmaputra basin.

4.4.2 It was informed that the "NERGS-II Dibang Basin" scheme shall facilitate evacuation of about 3.5GW Hydro capacity in Dibang sub-basin. Based on the evacuation system mentioned in the Master Plan while considering the timeline of 2031 of Dibang HEP and requirement of about 4-5 years for approval, award and implementation of the transmission scheme in hilly terrain of NER, it was proposed that scheme to be implemented under ISTS as common augmentation and other potential HEPs in Dibang basin.

4.4.3 CE (PSPA-II), CEA stated that recently Assam has informed about implementation of various PSPs in the State. Some of the power from these PSPs are expected to be evacuated through common augmentation identified for HEPs in Dibang sub-basin.

4.4.4 CTUIL also stated that very recently additional application(s) have been received for ISTS connectivity from HEPs and PSPs in Arunachal Pradesh and Assam respectively. For evacuation of power from these new HEPs and PSPs Damwe Lower HEP, some of the transmission systems identified for power evacuation of Dibang HEP would be common. However, the timeframes of COD of new HEPs in Arunachal Pradesh & PSPs in Assam are different and prior to start date of Dibang HEP. Therefore, there may be a change in the required timeframe of some of the identified transmission systems under the subject scheme.

4.4.5 After deliberations, NCT decided that the scheme shall be holistically reviewed considering the instant application of Dibang HEP alongwith additional applications of the upcoming HEPs in Aruncahal Pradesh and PSPs in Assam. NCT directed CTUIL to make a comprehensive proposal including these aspects and propose the same to the NCT.

4.5 Augmentation of Transformation capacity at 765/400 kV Champa PS by installation of 1500 MVA ICT, 765/400 kV (4th ICT on Bus Section-B)

4.5.1 Representative of CTUIL stated that Korba Power Ltd. (Erstwhile Lanco Amarkantak Power Ltd.) has applied for connectivity for its Phase-II generation project 2x660 MW at 400 kV level of Champa PS. Earlier, connectivity was granted to M/s Lanco at Champa PS through 400 kV D/c line on bus Section-A (where Lara TPS-I units are connected). However, under the revised load-generation scenario and considering

reverse flow requirements on the Raigarh – Pugalur HVDC link (from SR to WR), constraints are being observed on Raigarh (Kotra) 765/400 kV ICTs.

4.5.2 He further added that it is contemplated to grant connectivity to 2x660 MW TPS of Korba Power Ltd. on 400 kV Champa PS Bus Section B (where 3x600 MW TPS of KSK and 2x800 MW Lara TPS-II of NTPC are connected) through a 400 kV D/c line. With the addition of this upcoming generation project, no further injection margins would be available at Champa PS, and N-1 compliance limit of the 765/400 kV ICTs at Bus Section B would be violated.

4.5.3 It was also informed that the subject Transmission Scheme would facilitate immediate injection of power at Champa PS (Bus Section-B). Considering the N-1 Compliance limit of the ICTs, installation of 4th 765/400 kV, 1500 MVA ICT at Champa PS (Section-B) shall form part of the Associated Transmission System (ATS) for 2x660 MW TPS of Korba Power Ltd. (erstwhile Lanco Amarkantak Power Ltd.).

4.5.4 Representative of CTUIL further mentioned that for onward evacuation of power from Champa PS, the WR-ER Inter-Regional Network Expansion Scheme - Part A (inter-alia including Raigarh Kotra-II – Raigarh (Tamnar) – Jamshedpur 765 kV D/c Inter- Regional corridor} is required. The scheme is presently under the bidding stage and has an expected SCOD of 36 months from the effective date (tentatively June 2029, considering SPV transfer in June 2026). Accordingly, the proposed ICT augmentation at Champa PS is to be implemented in a timeframe matching the WR-ER Inter-Regional Network Expansion Scheme - Part A.

4.5.5 After deliberations, NCT approved the transmission scheme ***"Augmentation of transformation capacity at 765/400kV Champa PS by installation of 1500 MVA ICT, 765/400 kV (4th ICT on Bus Section-B)"*** under RTM mode with the following details:

Sl. No.	**Name of the scheme and tentative implementation timeframe**	**Estimated Cost (₹ Crore)**	**Remarks**
I.	Augmentation of Transformation capacity at 765/400 kV Champa PS by installation of 1500 MVA ICT, 765/400 kV (4th ICT on Bus Section-B) **Implementation timeframe:** Matching with the commissioning of the WR-ER Inter-Regional Network Expansion Scheme - Part A (36 months from effective date)	145.12	Under RTM through POWERGRID

4.5.6 Details of the scheme are given below:

Sl. No.	**Scope of the Transmission Scheme**	**Capacity /km**

1.	Augmentation of transformation capacity at 765/400 kV Champa PS by installation of 1500 MVA, 765/400 kV ICT (4th ICT on Bus Section-B) with associated ICT bays	• 765/400 kV, 1500 MVA ICT – 1 No. (comprising 3x500 MVA single-phase units) • 765 kV ICT bays – 1 No. (utilizing existing Bay No. 726, presently occupied by 765 kV, 240 MVAR Bus Reactor, along with Bay 725 - Tie Bay) • 400 kV ICT bay –1 No. (Bay No. 433 - New, along with Bay No. 434 - Tie Bay (New)) • 765kV Bus Reactor Bay – 1 No. (New Bay No. 724)

Note:

a. Installation of 1500 MVA, 765/400 kV ICT (4th ICT on Bus Section-B), utilizing existing main Bay No. 726 and tie Bay No. 725, shall be undertaken after dismantling, shifting & re-commissioning of the existing 765 kV, 240 MVAR Bus Reactor (presently terminated in Bay No. 726) to new main Bay No. 724.

b. The existing 80 MVAR, 765 kV single-phase spare reactor shall be utilized for switching with the shifted Bus Reactor. Accordingly, extension of auxiliary bus and neutral bus (~800 m each) through overhead connections shall be required.

4.6 Transmission system for Evacuation of Power from RE Projects in Solapur SEZ (Phase-II: 2000 MW) and Network Expansion Scheme to enable drawl of power from Solapur PS

4.6.1 Representative of CTUIL stated that 3.5 GW REZ potential has been identified in the Solapur area (2 GW at Solapur (PG) and 1.5 GW at Solapur PS). Solapur PS is presently under implementation by M/s Solapur Transmission Limited (STL), a subsidiary of Torrent Power Limited, with SCOD of March 2026 for evacuation of 1.5 GW RE power. Connectivity applications aggregating to approximately 7.15 GW RE capacity have been received in Solapur area (including 5.15 GW at Solapur PS and 2 GW at Solapur (PG).

4.6.2 In the 27th NCT meeting held on 06.02.2025, it was proposed to expand Solapur PS to its full capacity of 3.5 GW (i.e., additional 2 GW), for which the subject scheme was conceptualized. It was further decided that the subject scheme would be taken up after obtaining feedback from MNRE regarding additional RE potential in the Solapur area. Subsequently, in the 29th NCT meeting held on 17.04.2025, it was decided that schemes beyond MNRE-declared potential shall be taken up only after formal declaration of such potential by MNRE. Thereafter, MNRE vide letter dated 20.02.2026, declared an additional 7 GW potential, making the cumulative potential of 10.5 GW in the Solapur area.

4.6.3 Accordingly, CTUIL proposed to take up the **Solapur PS (Phase-II: 2 GW)** scheme

to enable evacuation of 2000 MW Power from RE Projects in Solapur SEZ in Maharashtra. Further, the scheme is envisaged to ensure reliable dispersal of power from Solapur PS towards **Barshi, Paranda and Jeur** areas of Maharashtra, thereby mitigating overloading and low-voltage issues in the adjoining network.

4.6.4 Members opined that considering a indicative of surplus of 48-95 GW even with 40% technical minimum loading on thermal units for the different 2030-31 scenarios, power beneficiaries of this system needs to be identified. Further, the scheme may be reviewed taking into account the plan for the intra state network of Maharashtra.

4.6.5 After detailed deliberations, NCT directed CTUIL to comprehensively review the scheme in coordination with MSETCL and other concerned stakeholders.

4.7 Reconductoring of Gooty – Tumkur (Pavagada) 400kV D/c line with HTLS conductor

4.7.1 Representative of CTUIL stated in the ISTS Rolling plan report for 2029-30, it is highlighted that loading on Gooty – Tumkur (Pavagada) 400kV D/c line is crossing its thermal rating (850 MVA) under N-1 contingency. The high loading is observed during the peak RE time due to High RE injection at Tumkur (Pavagada) from ISTS as well STU network.

4.7.2 He further added that, NLDC, Grid-India in its operational feedback for Q4 2024-25 (Jan'25-Mar'25) and Q1 2025-26 (Apr'25-Jun'25) has highlighted the issue of high loading on Gooty – Tumkur (Pavagada) 400kV D/c line.

4.7.3 Accordingly, it was proposed for reconductoring of Gooty – Tumkur (Pavagada) 400kV D/c line with HTLS conductor along with associated bay upgradation works at Gooty and Tumkur (Pavagada) substations.

4.7.4 After detailed deliberations, NCT approved the transmission scheme **"**Reconductoring of Gooty – Tumkur (Pavagada) 400kV D/c line with HTLS conductor" under RTM mode with following details:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crore)	Remarks
I.	Reconductoring of Gooty – Tumkur (Pavagada) 400kV D/c line with HTLS conductor. **Implementation timeframe:** 24 months	Rs. 341.21 crore	Under RTM through POWERGRID

4.7.5 Details of the scheme are given below:

Sl. No.	Scope of the Transmission Scheme	Capacity /km
1.	Reconductoring of Gooty – Tumkur (Pavagada) 400kV D/c line with HTLS conductor (Capacity - 2100 MVA)	~ 104.5 km

Sl. No.	Scope of the Transmission Scheme	Capacity /km
2.	Upgradation of bay equipments at Gooty end	-
3.	Upgradation of bay equipments at Tumkur (Pavagada) end	-

4.8 **Transmission System for Integration of Kadapa-II REZ (Phase-I)**

4.8.1 Representative of CTUIL stated that MNRE has identified addition of 86 GW RE Potential in the State of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu (Offshore) in Southern Region. Out of the identified (86 GW) RE Potential in Southern Region, 51 GW has been identified in the State of Andhra Pradesh which includes 8 GW at Kadapa area.

4.8.2 The transmission system for integration of RE potential in Kadapa area has been identified in two phases. Further, it was proposed that initially transmission system for Phase-I Kadapa-II REZs may be taken up for implementation and Phase-II transmission system may be taken up subsequently based on the receipt of further applications. The details of the transmission system is as below:

- Phase-I (4.5GW)

  - Establishment of 4x1500 MVA, 765/400 kV and 5x500 MVA, 400/220kV Kadapa-II Pooling Station along with 765kV, 2x330 MVAr bus reactors
  - ± 300 MVAr STATCOM at Kadapa-II
  - Kadapa-II – Thiruvalam 765kV D/c line (250 km) 1x240 MVAr SLR (convertible) both ends on both circuits
  - Ananthapuram-III – Kadapa-II 765kV D/c line (220 km) with 1x330 MVAr SLR (convertible) at Ananthapuram-III end on both circuits

- Phase-II (3 GW)

  - Augmentation of 2x1500 MVA, 765/400 kV and 5x500 MVA, 400/220kV Kadapa-II Pooling Station
  - Upgradation of Nagapattinam GIS to 765 kV level with 2x1500 MVA, 765/400kV ICTs
  - Thiruvelam – Nagapattinam 765kV D/c line (250 km) 1x240 MVAr SLR (convertible) at both ends on both circuits

4.8.3 It was also mentioned that the Phase-I scheme for 4.5 GW was also discussed in 32nd NCT meeting held on 12.08.2025, wherein it was decided that as the Connectivity applications were very less, Kadapa-II transmission system may be deliberated in next NCT meeting based on the receipt of further Connectivity applications.

4.8.4 Representative of CTUIL stated that presently, connectivity applications for grant of connectivity at Kadapa-II PS for about 2150 MW from 7 nos. of applicants have been received. Further, Phase-II transmission scheme for Ananthpuram-III PS is yet to be

finalized. In view of above, it is proposed to consider implementation of Phase-I transmission scheme [excluding Ananthapuram-III – Kadapa-II 765kV D/c line (220 km) with 1x330 MVAr SLR (convertible) at Ananthapuram-III end on both circuits] suitable for 3 GW of RE integration at Kadapa-II PS along with 10 nos. of 220 kV line bays for termination of various RE projects (7 for existing applicants + 3 for future).

4.8.5 After deliberations, NCT advised CTUIL to review the scheme again considering the surplus scenario and bring the scheme in the next NCT meeting.

4.9 Incorporation of element-wise tariff bifurcation in TBCB scheme

4.9.1 Member Secretary, NCT informed that a representation has been received from Electric Power Transmission Association (EPTA) requesting incorporation of element-wise tariff bifurcation along with provisions for part commissioning in the bid documents of the TBCB scheme *"Transmission System for integration of Krishnagiri REZ Phase-I"* prior to bid submission. EPTA, in its representation, submitted that the present RFP/TSA framework provides for recovery of 100% transmission charges only upon declaration of Commercial Operation Date (COD) of the entire transmission scheme. Considering the large scale, geographical spread, and electrical configuration of the project, EPTA has stated that the existing tariff recovery mechanism may not adequately reflect the phased execution and commissioning profile of the scheme, nor the operational benefits accruing from individual elements that may become available prior to completion of the entire project. EPTA requested the Ministry to direct incorporation of element-wise tariff bifurcation along with part commissioning provisions in the bid documents prior to bid submission.

4.9.2 Chairperson, NCT enquired whether any independent element of the scheme could be commissioned and utilized separately. In response, the representative of CTUIL informed that Transmission scheme for Krishangiri has been planned for evacuation of 7.5 GW of RE power. Presently, transmission capacity corresponding to 4.5 GW under Phase-I is currently under bidding and comprises of seven transmission elements. Further, Ananthapuram-III PS is also being integrated with Krishnagiri PS through Ananthapuram-III-Krishnagiri PS 765 kV D/c line under the transmission scheme "Transmission System for integration of Anantapur-III REZ Phase-I" for 3 GW. Ananthapuram-III REZ Ph-I is under bidding and expected in same timeframe as Krishnagiri Ph-I. Accordingly, "Transmission System for integration of Krishnagiri REZ Phase-I" shall also facilitate evacuation of RE power from Ananthapuram-III PS also. Accordingly entire Krishnagiri Ph-transmission scheme has been considered for grant of connectivity to RE applicants at Krishnagiri and Anantapur-III PS. Further commissioning of a single element alone would not enable effective utilization of the Krishnagiri substation, as the substation cannot be fully utilized without the associated transmission lines.

4.9.3 Representative of CTUIL further informed that connectivity has been granted at Krishnagiri PS considering the complete 4.5 GW evacuation system. In the event of

phased commissioning of transmission elements, the connectivity framework would also need to be aligned accordingly to ensure effective utilization of the commissioned assets.

4.9.4 It was also informed that Krishnagiri Ph-I was earlier agreed for implementation with implementation timeframe of 30 months from SPV transfer. However, considering the scale, geographic spread and RoW issues, implementation timeframe has been modified to 36 months in the 38th NCT meeting.

4.9.5 Further, in case of part commissioning of the transmission elements of the subject transmission scheme, COD of the same may be declared as per Regulation 27(c) of the CERC (Indian Electricity Grid Code) Regulations.

4.9.6 After detailed deliberations, NCT observed that incorporation of element-wise tariff bifurcation in the bid documents without interdependency is not feasible as entire transmission system has been planned together and considered for grant of connectivity. Further, there are provisions in the Regulations for CoD of part scheme.

4.10 Sharing of study files to OEMs prior to transfer of SPV

4.10.1 Member Secretary, NCT informed that a representation has been received from Electric Power Transmission Association (EPTA) mentioning the necessity of Network and PSSE Files at the Bidding Stage for Techno-Commercial Evaluation for the scheme "Transmission system for evacuation of power from Rajasthan REZ Phase-IV (Part-5: 6 GW) – Barmer Complex (Barmer-II: 6 GW Solar HVDC)" recommended in the 30th meeting of NCT held on 30th May 2025. EPTA, in its representation, mentioned that given the scale of the project and the high level of RE integration, the availability of validated and converged load flow and Dynamic files are essential and it consumes a significant portion of the project implementation timeline even before commencing the system design activities. In this regard, EPTA requested the following:

a) Provide load-flow converged files immediately, enabling the TSP to undertake the fine tuning to establish a dynamic case in steady state as well as the contingency cases in consultation with CEA, CTU and Grid India so that complete dynamic converged files are ready by bid conclusion.

OR

b) CTU may initiate preparation of converged data files now, relieving the TSP of this task. As the grid planner, CTU is best positioned to prepare and maintain such data and can provide the converged files upon bid conclusion. M/s REC may arrange for the preparation of converged dynamic data under CTU and ensure its availability at the time of bid conclusion.

4.10.2 Representative of CTUIL stated that such information / files are being shared only with the successful bidder. As the PSSE files contain sensitive system information and sharing the same during the bidding stage may pose security concerns for data

pertaining to Indian National grid, including identification of potential grid vulnerabilities. It was further mentioned that **Ministry of Power** had earlier directed that such information shall be shared only with the successful bidder after completion of the bidding process.

4.10.3 After deliberations, NCT directed that such information shall not be shared with prospective bidders during the bidding process and shall only be shared with the successful bidder.

5 Communication Schemes

5.1 Comprehensive Scheme for OPGW installation on the existing lines of ISTS in Southern Region

5.1.1 Representative of CTUIL mentioned that as per the CEA letter dated 22.05.2024, all lines 110 kV and above shall have Optical Ground Wire along with necessary terminal equipment for speech transmission, line protection, and data channels. Further as CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 primary path for tele-protection shall be on point-to-point Optical Ground Wire and alternative path shall be either on Power Line Carrier Communication or predefined physically diversified Optical Ground Wire paths. In addition, CEA vide their letter dated 22.11.2024, communicated that all the upcoming lines shall be provided with 48 Fiber OPGW to cater to broadband and internet requirements in the rural areas and hinterlands to provide reliable Telecom connectivity.

5.1.2 CTUIL proposed for installation of OPGW on the existing ISTS and STU lines in the 16th NPC meeting held on 04.07.2025. The Schemes was deliberated in the 54th TCC/57th SRPC meeting held on dated 16.03.2026/17.03.2026 and agreed by forum. SRPC concurred the ISTS portion of the OPGW proposal vide letter dated. 22.04.2026 with summary as mentioned below:

Sr. No.	**Implementing Agency**	**Projects**	**Total OPGW length (km)**	**Total no of FOTE (STM-16)**	**Estimated Cost (approx. in Crs.)**
1.	POWERGRID	RTM	265	2	15.81
2.	Kudgi Transmission Ltd. (M/s Sekura)	TBCB	92.57	0	5.09
Total			357.57	2	20.90

5.1.3 After deliberations, NCT approved the communication scheme “Comprehensive Scheme for OPGW installation on the existing lines of ISTS in Southern Region” with following details:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crore)	Remarks
I.	Comprehensive Scheme for OPGW installation on the existing lines of ISTS in Southern Region- Part A **Implementation timeframe:** 30 months from the date of allocation	15.81 crore	Under RTM through POWERGRID
II	Comprehensive Scheme for OPGW installation on the existing lines of ISTS in Southern Region- Part B **Implementation timeframe:** 24 months from the date of allocation	5.09 crore	Under RTM through Kudgi Transmission Ltd. (M/s Sekura)

5.1.4 Details of the scheme are given below:

- **Part-A**

(i) Supply & installation of OPGW (48F) on following lines:

(a) 400KV NP Kunta (PG) – Hindupur (APTANSCO) **– 120.34 kms.**

(b) Kurnool (APTRANSCO) -Gooty (PG) – **84.59 kms**.

(c) 220kV Kundra-Edamon – **60 kms**.

(ii) 1 no. of STM-16 FOTE at APSLDC along with required interfaces.

(iii) 1 no. of STM-16 FOTE at Kundra along with required interfaces.

(iv) All the equipment under this scheme to be integrated with UNMS

- **Part-B**-Supply & installation of OPGW (48F) on 400 KV Madhugiri - Bidadi D/c line (92.57 kms.) along with approach Cable, FODP and Optical Interfaces at both end Stations.

5.2 **Replacement of 12 no. of FOTE at critical ISTS locations in Southern Region**

5.2.1 Representative of CTUIL stated that, in view of incident of SRLDC communication link outage between Somanahalli - SRLDC a scheme for replacement of 12 nos. of critical FOTE was prepared. These 12 nos. FOTE cater important grid-operation data to SRLDC e.g. ICCP, RTU, PMU, DCPC and VOIP. Out of 12 no. of FOTE, 1 no. is proposed of STM-64 capacity and remaining 11 nos are proposed with STM-16 capacity.

5.2.2 After, NCT approved the communication scheme **"**Replacement of 12 no. of FOTE at critical ISTS locations in Southern Region" for implementation under RTM mode with following details:

Sl. No.	Name of the scheme and tentative implementation timeframe	Estimated Cost (₹ Crore)	Remarks

I.	Replacement of 12 no. of FOTE at critical ISTS locations in Southern Region **Implementation timeframe:** 18 months from the date of allocation	8.14 crore	Under RTM through POWERGRID

5.2.3 Details of the scheme are given below:

(i) Supply & installation of 12 no. of FOTE (1 nos. STM-64 capacity & 11 nos. STM-16 capacity)

(ii) All the equipment under this scheme to be integrated with UNMS

5.2.4 Details of FOTE which require replacement is given below along with their locations:

S. No.	Substation Name	Type of FOTE(STM-16/64)
1	PGCIL_SR2_SMNHL_2	STM64 (5 MSP)
2	PGCIL_SR2_THVLM765	STM16 (5 MSP)
3	PGCIL_SR2_Nagapatanam P S	STM16 (5 MSP)
4	PGCIL_SR2_PAVAGADA 5MSP	STM16 (5 MSP)
5	PGCIL_SR2_Madurai	STM16 (5 MSP)
6	PGCIL_SR2_KUDGI 765	STM16 (5 MSP)
7	PGCIL_SR2_udumalpet 400kv	STM16 (5 MSP)
8	PGCIL_SR2_Cochin	STM16 (5 MSP)
9	PGCIL_SR2_BHEL_Hiriyur	STM16 (5 MSP)
10	Yelahanka PG	STM16 (5 MSP)
11	Mysore PG	STM16 (5 MSP)
12	Trichur North	STM16 (5 MSP)
Total No. of FOTE		**12**

6 Status of the bids under process by BPCs

6.1 The BPCs (RECPDCL and PFCCL) have made presentations on the status of under bidding schemes. Summary of the same is given below:

S.N.	Region(s)	RECPDCL	PFCCL
1	Bidding Concluded	1	3
2	Bids Under Evaluation	3	2
3	RfP issued and bids to be submitted	6	7
4	RfP yet to be issued	1	1
5	RfP bid submission on hold	1	0
	TOTAL	**12**	**13**

6.2 Members noted the status of the schemes under bidding.

7 Evaluation of functioning of National Grid.

a) GRID-INDIA delivered a presentation (Presentation is enclosed at Annex-I) on

disturbance in Khavda RE complex covering the following aspects:

- A grid disturbance occurred in Khavda RE complex on 13th May 2026 at 1409 hrs resulting in complete outage of the 03 pooling stations – KPS-1, KPS-2 and KPS-3 having installed capacity of 15.9 GW (14.8 GW VRE + 1.1 GW BESS). During the event, around 17 nos. EHV lines (08 nos. 765 kV and 09 nos. 400 kV) tripped within 16 seconds. This is the largest generation loss event in the Indian grid till now.
- RE generation loss of approx. 9000 MW in Khavda complex and frequency dip of 0.56 Hz (from 49.953 Hz to 49.398 Hz) was observed.
- Automatic load shedding of around 6000 MW (against desired response of ~12000 MW) through operation of stage-1 automatic under frequency load shedding scheme (49.40 Hz) occurred. As per IEGC, 2023, Pumped storage hydro plants operating in pumping mode or ESS operating in charging mode shall be automatically disconnected before the first stage of under frequency load shedding. However, automatic load relief from most of the pumped storage plants was not received during the event. Primary frequency response arrested the frequency decline and helped the system frequency recover up to 49.598 Hz, following which additional generation dispatch was facilitated through AGC and tertiary reserves.
- Before the event (around 1402 hrs), dip in voltage in the Khavda complex was observed likely due to fault in 400 kV Indore – Asoj line along with suspected LVRT operation of few RE plants. Subsequently, between 1402 to 1406 hrs, low-frequency oscillations were observed in the complex (0.458 Hz). 03 LVRT operations with no generation reduction were also observed to be triggered due to the oscillations in this phase. At 1409 hrs, following a voltage dip, continuous reactive power injection was observed from RE plants leading to tripping of RE plants and evacuation lines possibly on HVRT and over-voltage protection. This behaviour of RE plants during the events needs to be analyzed by respective RE developers.

b) GRID-INDIA further stated that the above observations are based on the preliminary analysis of the event using PMU data. For detailed analysis, communication has already been sent to all RE plants for sharing of inverter-level granular data (1 ms resolution or better). The data is still awaited.

c) It was further informed that at present, system strength / SCR in Khavda, Rajasthan and Pachora RE complex is on the lower side. Low frequency oscillations possibly due to low SCR and improper tuning of controllers of RE plants to operate at low system strength conditions are being observed in these RE complexes on a regular basis. The correlation of oscillations with low SCR was established while facilitating the outage of 400 kV Bikaner – Bikaner-II D/C and during outage of 400 kV Pachora – Bhopal line in recent months.

d) GRID-INDIA also informed that fault level is also observed to improve only slightly

with commissioning of new lines. Further, the SCR is also observed to be on the lower side in future planning cases. Addition of BESS under non-solar hour connectivity would further reduce the SCR. Operational feedback regarding low SCR in RE complex has been shared with CEA and CTUIL. Matter was discussed in 12th NCT meeting held on 24th Mar 2023. Remedial measures may therefore be implemented on priority.

e) It was also informed that bus split operation reduces the fault level of both the buses. The performance of the VRE plants does not improve as both the buses still remain strongly coupled electrically and share the grid strength. Therefore, bus split should not be considered a substitute for system strength improvement.

f) GRID-INDIA suggested that the commissioning of planned STATCOMs at Khavda PS-I and III envisaged in 2026 may be expedited to provide fast dynamic reactive power support in the complex.

g) Following measures were suggested by GRID-INDIA in their presentation:

- Tuning of RE plant controllers such that they operate reliably in low system strength conditions also
- Sharing of root cause analysis and corrective measures being taken for events / oscillations in RE complexes by respective developers
- Sharing of inverter level data by RE plants for detailed event / oscillation analysis
- As per the decision taken in 12th NCT meeting held on 24th Mar 2023, uniform methodology for computing SCR based on operational experience shall be finalized. The necessary inputs have already been submitted by GRID-INDIA in the meeting held under the chairmanship of Member (PS), CEA on 11th April 2023.
- Consideration of SCR along with N-1 reliability criteria in planning stage while granting connectivity to RE plants and BESS
- Measures to improve grid strength in high RE complexes:
  - Mandating GFM in BESS above 50 MW and RE plants
  - Planning and implementation of SynCONs, pumped storage plants or other suitable technical solution on priority in large RE complexes – (At present, no SynCON / pumped storage plant is approved in Khavda complex)
- Measures to improve damping such as:
  - Interconnection of ISTS with intra-state network
  - Planning of loads near major RE pooling stations
- Amendment in CEA Connectivity Standards to include necessary technical provisions for RE plants, BESS, Bulk loads etc. Inputs in this regard have already been submitted by GRID-INDIA in various meetings held at CEA in last year (2025).

h) After deliberations, following were agreed:

- GRID-INDIA to analyze UFR operation in detail and pursue the utilities for corrective actions where response was inadequate
- NRPC and WRPC to pursue the RE developers for sharing of root cause analysis / inverter level granular data and tuning of respective plants
- CTUIL to coordinate with respective TSPs for expediting commissioning of planned STATCOMs in Khavda RE complex
- CEA (GM Division) to issue Office Memorandum (OM) mandating grid forming inverters (GFM) in all new BESS above 50 MW and 25% GFM capacity in all new RE plants. Further, CEA shall expedite necessary amendment in Connectivity Standards
- As per the decision taken in 12th NCT meeting held on 24th Mar 2023, the team constituted under Member (PS) shall expedite the finalization of uniform methodology for computing SCR
- CTUIL shall plan measures such as SynCONs to improve grid strength in RE complexes

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List of participants of the 41st meeting of NCT

CEA:

1. Sh. Ghanshyam Prasad, Chairperson, CEA & Chairperson, NCT
2. Sh. Praveen Gupta, Member (E&C)
3. Sh. V.K. Singh, Member (PS)
4. Sh. B. S. Bairwa, Chief Engineer (PSPA-II)
5. Smt. Ammi R Toppo, Chief Engineer (PSPA-I)
6. Sh. Bhanwar Singh Meena, Director (PSPA-I)
7. Sh. Farooque Iqbal, Director (PSPA-II)
8. Smt. Naghma Furqan, Director (PSCD)
9. Sh. Ganeshwara Rao Jada, Director (PSPA-I)
10. Sh. Pranay Garg, Deputy Director (PSPA-II)
11. Sh. Akshay Dubey, Deputy Director (PSPA-II)
12. Sh. Nitin Deswal, Deputy Director (PSPA-I)
13. Sh. Prateek Jadaun, Assistant Director (PSPA-II)

MoP:

1. Sh. Pankaj Kumar, Joint Secretary (Trans.)

RPCs:

1. Sh. Sanjeev Kumar Sood, Director (Technical), PSTCL
2. Sh. Stephen Fernandes, Chief Electrical Engineer, WRPC
3. Sh. K.B. Jagtap, MS , ERPC
4. Sh. I.K Mehra, Director, ERPC
5. Sh. Asit Singh, MS (SRPC)
6. Sh. Len. J.B, SE (SRPC)
7. Shri T Sivakumar, MD (TANTRANSCO)
8. Chief Engineer/TS, PSTCL

MNRE:

1. Sh. Rajesh Kulhari, Joint Secretary
2. Sh. Anupam Kumar, Joint Secretary
3. Sh. Tarun Singh, Scientist E

SECI:

1. Sh. R.K Agarwal, Consultant
2. Sh. Samir Nag, Manager

CTUIL:

1. Sh. K.K. Gupta, COO
2. Sh. RVMM Rao, CGM
3. Sh. Rajesh Kumar, CGM
4. Sh. Kishore Kr Sarkar, CGM
5. Smt. Nutan Mishra, Sr. GM

6. Sh. Anil Kumar Meena, GM
7. Sh. Shiv Kumar Gupta, Sr. DGM
8. Sh. T.P. Verma, DGM
9. Sh. Sandeep Kumawat, DGM
10. Sh. T P Verma, DGM
11. Sh. Ajay Dahiya, DGM
12. Sh. Venkatesh Gorli, Chief Manager
13. Sh. Anupam Kumar, Chief Manager
14. Sh. Shashank Shekhar, Chief Manager
15. Sh. Mahendranath Malla, Chief Manager
16. Sh. Mritunjay Kumar, Chief Manager
17. Sh. Abhilash Thakur, Assistant Manager
18. Sh. Madhusudan Meena, Assistant Manager
19. Sh. Tanay Jaiswal, Engineer

GRID India:

1. Sh. S.C. Saxena, CMD
2. Sh. Rajiv Porwal, Director (SO)
3. Sh. Vivek Pandey, CGM
4. Sh. Priyam Jain, Chief Manager
5. Sh. Gaurab Dash, Dy Manager

Expert Member

1. Sh. S. R. Narasimhan

RECPDCL

1. Sh. Ritam Biswas, Dy Manager
2. Sh. Ashwani Kumar, Executive (Tech)

PFCCL

1. Sh. Naveen Phougat, GM
2. Smt. Nirmala Meena , DGM
3. Sh. Sourav Chakraborty, Advisor