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

सेवा में / To

1.	Chairperson, Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	2.	Member (Power System), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.
3.	Member (Economic & Commercial), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	4.	Director (Trans) Ministry of Power Shram Shakti Bhawan, New Delhi-110001.
5.	Chief Operating Officer, Central Transmission Utility POWERGRID, Saudamini, Plot No. 2, Sector-29, Gurgaon – 122 001.	6.	Sh. Surinder Singh Sur, Joint Adviser (Energy) NITI Aayog, Parliament Street, New Delhi – 110 001.
7.	Shri P. K. Pahwa, Ex. Member (GO&D), CEA 428 C, Pocket -2, Mayur Vihar, Phase -1, Delhi – 110091.	8.	Shri Prabhakar Singh, Ex. Director (Projects), POWERGRID D 904, Tulip Ivory, Sector-70, Gurgaon – 122 001.

विषय: 31<sup>st</sup> जुलाई 2019 को आयोजित "ट्रान्समिशन पर राष्ट्रीय समिति" (एनसीटी) की चौथी बैठक - मीटिंग नोटिस  
Subject: 4<sup>th</sup> meeting of "National Committee on Transmission" (NCT) to be held on 31<sup>st</sup> July 2019  
– Agenda

Sir/Madam,

The Agenda for the 4<sup>th</sup> meeting of the "National Committee on Transmission" (NCT) was circulated vide email dated 27.07.2019. The Agenda Item no. 8.4 is hereby dropped due to non submission of CBG by developer. Agenda Item no. 2 is also dropped as Minutes of 4<sup>th</sup> meeting of ECT are yet to be issued. The modified Agenda is available on CEA website <http://www.cea.nic.in>. (path to access: Home Page-Wing-Power System-PSPA I-National Committee on Transmission)

4<sup>th</sup> meeting of the "National Committee on Transmission" (NCT) is scheduled to be held on **31<sup>st</sup> July 2019 at 3:00 pm** under the chairmanship of Shri P. S. Mhaske, Chairperson, CEA in conference Room of CEA (Chintan), 2<sup>nd</sup> Floor, Sewa Bhawan, R.K. Puram, New Delhi.

Kindly make it convenient to attend the meeting.

Yours faithfully,

(Goutam Roy)

Chief Engineer(PSPA-I) &amp; Member Secretary (NCT)

Copy to:

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- (i) Joint Secretary (Trans), Ministry of Power, Shram Shakti Bhawan, New Delhi-110001
- (ii) Chief Engineer (PSPA-II), CEA
- (iii) CEO, RECTPCL, ECE House, 3<sup>rd</sup> Floor, Annexe - II, [28A, KG Marg, New Delhi - 110001](#)
- (iv) PFC Consulting Ltd, First Floor, "Urjanidhi", 1, Barakhmba Lane, Connaught Place, New Delhi -110001

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**Agenda note for the 4<sup>th</sup> meeting of National Committee on Transmission (NCT)****Date and Time: 31<sup>st</sup> July, 2019 at 03:00 pm****Venue: Conference Room of CEA (Chintan), 2<sup>nd</sup> Floor, Sewa Bhawan, R.K. Puram, New Delhi****1. Confirmation of the minutes of 3<sup>rd</sup> meeting of National Committee on Transmission (NCT)**

1.1. The minutes of 3<sup>rd</sup> meeting of National Committee on Transmission held on 1<sup>st</sup> March, 2019 were issued vide CEA letter No. File No.CEA-PS-11-15(11)/1/2018-PSPA-I/4170/2019/1766-1773 dated 14<sup>th</sup> March 2019. No comment / observation has been received on the minutes of the meeting.

1.2. The minutes of the meeting may be confirmed.

**2. Modifications in the transmission schemes already recommended by NCT and ECT****2.1 Transmission Schemes recommended for implementation through TBCB**

2.1.1. Nine nos. of transmission schemes related to RE were recommended for implementation through TBCB route in the 2<sup>nd</sup> meeting of NCT and 3<sup>rd</sup> meeting of ECT. The schemes are under bidding stage. Subsequent to the 3<sup>rd</sup> meeting of ECT, the transmission schemes were deliberated in the 2<sup>nd</sup> WRSCT meeting and 3<sup>rd</sup> NRSCT meeting, held on 21.5.2019 and 24.5.2019 respectively wherein the following modifications in the scheme have been agreed:

Item No.	Scheme name	Table location	As recorded in the minutes of the meeting	Corrigendum proposed
5.2	<b>WRSS-21 Part-A (TBCB):</b> Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS	Sl. No. 1 3 <sup>rd</sup> Column	2x1500MVA, 765/400kV 400kV ICT bay-2 765kV ICT bay-2 400kV line bay-4 765kV line bay-2 1x330MVAr, 765 kV, 1x125MVAr, 420 kV 765kV Reactor bay- 1 400kV Reactor bay -1	2x1500MVA, 765/400kV 400kV ICT bay-2 765kV ICT bay-2 400kV line bay-4 765kV line bay-2 1x330MVAr, 765 kV, 1x125MVAr, 420 kV 765kV Reactor bay- 1 400kV Reactor bay -1  <b>1x500 MVA, 765/400 kV, 1-ph ICT (spare unit)</b>  <b>1x110 MVAR, 765 kV, 1 ph. reactor (spare unit)</b>

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				(for both 1x330 MVAR bus reactor under Part A and 1x330 MVAR line reactor on Lakadia-Vadodara line under Part B)
5.3	<b>WRSS-21 Part-B (TBCB)</b> - Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS	Sl. No. 2 3 <sup>rd</sup> Column	330 MVAR reactor - 4 765kV Reactor bay - 4	330 MVAR reactor - 4 765kV Reactor bay - 4  <b>1x110 MVAR, 765 kV, 1 ph. switchable line reactor (spare unit) at Vadodara end</b>
5.4	Transmission System associated with RE generations at Bhuj-II, Dwarka&Lakadia	Sl. No. 3 3 <sup>rd</sup> Column	2x240 MVAR 765kV reactors along with bays -2	2x240 MVAR 765kV reactors along with bays -2  <b>1x80 MVAR, 765 kV, 1ph. switchable line reactor (spare unit) at Lakadia end</b>
5.5	Transmission System for providing connectivity to RE projects at Bhuj-II (2000MW) in Gujarat	Sl. No. 1 3 <sup>rd</sup> Column	765/400kV, 2x1500MVA, 400/220kV, 4x500MVA 765kV ICT bay-2 400kV ICT bay-6 220kV ICT bay- 4 765kV line bay-4 220kV line bays -7 1x330MVAR, 765kV, 1x125MVAR, 420kV 765kV reactor Bays -1 420kV reactor Bays -1	765/400kV, 2x1500MVA, 400/220kV, 4x500MVA 765kV ICT bay-2 400kV ICT bay-6 220kV ICT bay- 4 765kV line bay-4 220kV line bays -7 1x330MVAR, 765kV, 1x125MVAR, 420kV 765kV reactor Bays -1 420kV reactor Bays -1  <b>1x500 MVA, 765/400 kV, 1 ph. ICT (spare unit)</b>  <b>1x110 MVAR, 765 kV, 1 ph. reactor (spare unit)</b>
		Additional scope to be	-	<b>1x240 MVAR switchable line</b>

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		added at Sl. No. 3 2 <sup>nd</sup> Column: <b>Scope</b>		<b>reactor for each circuit at Bhuj II PS end of Bhuj II - Lakadia 765 kV D/C line</b>
		Additional scope to be added at Sl. No. 3 3 <sup>rd</sup> Column: <b>Capacity</b>	-	<b>2x240 MVAR, 765 kV with 400 ohm NGR 765 kV reactor bays- 2 nos. 1x80 MVAR, 765 kV, 1 ph. switchable line reactor (spare unit) at Bhuj II end</b>
5.8	Transmission schemes for providing connectivity to RE projects in potential wind energy and solar energy zones in WR [Lakadia (2000MW), Osmanabad (2000MW) & Solapur(1000 MW)]:	2 <sup>nd</sup> table tabulating transmission elements for "Transmission system associated with RE generations from potential wind energy zones in Osmanabad area of Maharashtra" S.no 1, 2 <sup>nd</sup> column : <b>Scope</b>	Establishment of 4x500MVA, 400/220kV near Kallam PS	Establishment of 2x500MVA, 400/220kV near Kallam PS *
		S.no 1, 3 <sup>rd</sup> column : <b>Capacity</b>	4x500MVA,400/220kV 400kV ICT bay-4 220kV ICT bay-4 400kV line bay-4 220kV line bay- 8	2x500MVA, 400/220kV 400kV ICT bay-2 220kV ICT bay-2 400kV line bay-4 220kV line bay- 4
6.1	Transmission system associated with LTA applications from Rajasthan SEZ Part-A	Sl. No. 1 3 <sup>rd</sup> Column	765/400kV – 3x1500 MVA, 765kV ICT bay-3 400kV ICT bay-3 400kV line bay-2 765kV line bay-2 240 MVAR 765 kV	765/400kV, 3x1500 MVA, 765kV ICT bay-3 400kV ICT bay-3 400kV line bay-2 765kV line bay-2 240 MVAR 765 kV

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			reactor-2 no. 125 MVAr400 kV reactor-1 no. 765kV reactor bay-2 400kV reactor bay-1	reactor-2 no. 125 MVAr400 kV reactor-1 no. 765kV reactor bay-2 400kV reactor bay-1  <b>1x500 MVA, 765/400 kV, 1 ph. ICT (spare unit)</b>  <b>1x80 MVAr, 765 kV, 1 ph reactor (spare unit)</b>
		Sl. No. 4 3 <sup>rd</sup> Column	765/400kV - 2x1500MVA 765kV ICT bay-2 400kV ICT bay-2 400kV line bay-2 765kV line bay-4 240 MVArbus reactor-2 125 MVAr bus reactor- 1 765kV reactor bay-2 400kV reactor bay-1	765/400kV, 2x1500MVA 765kV ICT bay-2 400kV ICT bay-2 400kV line bay-2 765kV line bay-4 240 MVArbus reactor-2 125 MVAr bus reactor-1 765kV reactor bay-2 400kV reactor bay-1  <b>1x500 MVA, 765/400 kV, 1 ph. ICT (spare unit)</b>  <b>1x80 MVAr, 765 kV, 1 ph. reactor (spare unit) (for both 2x240 MVAr bus reactor and 2x240 MVAr line reactor on Bikaner- Bhadla II 765 kV D/C line (after LILO))</b>
		Sl. No. 8 3 <sup>rd</sup> Column	330 MVAr reactor-2 765kV reactor bay-2	330 MVAr reactor-2 765kV reactor bay-2  <b>1x110 MVAr, 765 kV, 1 ph. reactor (spare unit)</b>
6.1	Transmission system associated with LTA applications from Rajasthan SEZ Part-A.	Sl. No. 10 3 <sup>rd</sup> Column	<b>765 kV line bay- 4</b>	<ul style="list-style-type: none"> <li>765 kV line bay (AIS)- 3 (2 bays at Ajmer (PG) S/stn</li> </ul>

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	Transmission elements at S.no 9 and 10 have been separated and are being implemented as separate scheme Scheme named as <b>“Construction of Ajmer (PG)-Phagi 765 kV D/C line along with associated bays for Rajasthan SEZ”</b>			and 1 bay at Phagi (RVPN) S/stn)  • 1 complete GIS DIA 765 kV (2 Main Breakers and 1 Tie Breaker) at Phagi (RVPN) S/stn.
		Additional scope to be added as Sl no. 11 2 <sup>nd</sup> column <b>Scope</b>		1X240MVA, 765 kV Bus Reactor with GIS bay at Phagi 765/400 kV S/stn
		Additional scope to be added at Sl no. 11 3 <sup>rd</sup> column <b>Capacity</b>		1x240 MVA, 765kV Reactor  765kV reactor Bay (GIS) -1 (2 <sup>nd</sup> Main bay of the new DIA being created for termination of 765 kV D/c line from Ajmer)
		Note (b)	POWERGRID and RVPN to provide space for 2 nos. of 765kV bays at Ajmer(PG) and Phagi (RVPN) respectively for termination of Ajmer (PG)– Phagi 765kV D/c line	(b)POWERGRID to provide space for 2 nos. of 765kV bays (AIS) at Ajmer(PG) for termination of Ajmer (PG)– Phagi 765kV D/c line  (c) RVPNL to provide space for 1 no. of AIS bay and 1 complete GIS DIA at Phagi (RVPN) for termination of Ajmer (PG)– Phagi 765kV D/c line and space for installation of bus reactor at Phagi (RVPN).
6.3	Transmission system associated with LTA applications from Rajasthan SEZ Part-C	Sl. No. 1 2 <sup>nd</sup> Column	Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri with 765kV (2x240MVAR) and 400kV (1x125 MVAR) bus reactor <u>Future provisions:</u> Space for:	Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri with 765kV (2x240MVAR) and 400kV (1x125 MVAR) bus reactor <u>Future provisions:</u> Space for:

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		400/220 kV ICTs along with bays: 4 nos. 765kV line bays: 4nos 400kV line bays: 4nos. 220kV line bays: 7nos	<b>765/400 kV ICTs along with bays: 2 nos.</b> 400/220 kV ICTs along with bays: 4 nos. 765kV line bays: 4nos 400kV line bays: 4nos. 220kV line bays: 7nos
Sl. No. 1 3 <sup>rd</sup> Column	765/400kV - 2x1500MVA 765kV ICT bay-2 400kV ICT bay-2 400kV line bay-2 765kV line bay-2 240 MVar (765kV) Bus Reactor -2 125MVar (400 kV) Bus Reactor -1 765 kV Reactor bay - 2 400 kV Reactor bay -1	765/400kV - 2x1500MVA 765kV ICT bay-2 400kV ICT bay-2 400kV line bay-2 765kV line bay-2 240 MVar (765kV) Bus Reactor -2 125MVar (400 kV) Bus Reactor -1 765 kV Reactor bay - 2 400 kV Reactor bay -1	<b>1x500 MVA, 765/400 kV, 1 ph. ICT (spare unit)</b>  <b>1x80 MVar, 765 kV, 1 ph. reactor (spare unit) (for both 2x240 MVar bus reactor and 2x240 MVar line reactor on Bikaner- Khetri 765 kV D/C line at Khetri end)</b>
Sl. No. 6 3 <sup>rd</sup> Column	240 MVAR Line reactor -2 765 kV Reactor bay -2	240 MVAR Line reactor -2 765 kV Reactor bay -2	<b>1x80 MVar, 765 kV, 1 ph. reactor (spare unit)</b>



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				(for 2x240 MVA line reactor on Khetri- Jhatikara 765 kV D/C line at Jhatikaraend)
6.4	Transmission system associated with LTA applications from Rajasthan SEZ Part-D	Sl. No. 3 3 <sup>rd</sup> Column	1x240 MVA Line reactor -4 765 kV Reactor bay -4	1x240 MVA Line reactor -4 765 kV Reactor bay -4 <b>1x80 MVA, 765 kV, 1 ph. reactor (spare unit)</b> <b>(for 2x240 MVA line reactor on Bikaner- Khetri 765 kV D/C line at Bikaner end)</b>

*\*Capacity of Kallam 400/220 kV Pooling station agreed as part of ISTS reduced to 1000 MW ( from 2000 MW already planned) as evacuation system for 1 GW RE projects is being planned by MSETCL. [ Agreed in 2<sup>nd</sup> WRSCT meeting held on 21.5.2019]*

2.1.2. The above proposed modifications have already been incorporated in the RfP documents of the respective schemes and have been agreed in the 4th meeting of ECT held on 12.07.2019 ( except for item at 5.8).

2.1.3. Members may please note.

## 2.2 Transmission Schemes recommended for implementation through RTM

2.2.1. In the 2<sup>nd</sup> meeting of WRSCT held on 21.5.2019, the following modifications in the transmission schemes have been agreed. The scheme has already been recommended in 2<sup>nd</sup> ECT meeting to be implemented through RTM route by POWERGRID.

Item No.	Scheme name	Table location	As recorded in the minutes of the 2nd meeting of ECT	Corrigendum proposed
Annexure B	<b>Augmentation of transformation capacity in Western Region</b>	Sl. No. 13 3 <sup>rd</sup> Column	A) Jabalpur 400/220kV S/S of POWERGRID (i) 400/220kV, 500MVA ICT – 1 no (ii) 400kV ICT bay - 1 no (iii) 220kV ICT bay-1 no.  B) Itarsi 400/220 kV S/S of POWERGRID (i) 400/220kV	A) Jabalpur 400/220kV S/S of POWERGRID (i) 400/220kV 500MVA ICT - 1 no (ii) 400kV ICT bay - 1 no (iii) 220kV ICT bay- 1 no.  B) Itarsi 400/220 kV S/S of POWERGRID

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			500MVA ICT – 1 no. (ii) 400kV ICT bay -1 no. (iii) 220kV ICT bay-1 no.	(i) 400/220kV 500MVA ICT – 1 no. (ii) 400kV ICT bay -1 no. <b>(outdoor GIS bay adopting 2 CB scheme)</b> (iii) 220kV ICT bay-1 no.
	Sl. No. 13 3 <sup>rd</sup> Column		68	71

2.2.2. In the 2<sup>nd</sup> meeting of WRSCT held on 21.5.2019, the following modifications in the transmission schemes have been agreed. The scheme has already been recommended in 3<sup>rd</sup> ECT meeting to be implemented through RTM route by POWERGRID.

Item No.	Scheme name	Table location	As recorded in the minutes of the 3 <sup>rd</sup> meeting of ECT	Corrigendum proposed
B1	<b>Additional 1x500MVA 400/220kV (9th) ICT at Bhuj Pooling Station</b>	Sl. No. 1 3 <sup>rd</sup> Column	Additional 1x500MVA 400/220kV (9th) ICT, for injection from any additional RE project (other than 4000MW injection under SECI bids upto Tranche IV) in existing Bhuj PS with associated 400 kV GIS bay and 220kV AIS bay	Additional 1x500MVA 400/220kV (9th) ICT, for injection from any additional RE project (other than 4000MW injection under SECI bids upto Tranche IV) in existing Bhuj PS with associated 400 kV GIS bay and 220kV <b>Hybrid/MTS bay</b>
B2-5	<b>ICT Augmentation works at existing Moga (PG) ISTS S/S associated with LTA applications from SEZs in Rajasthan</b>	3 <sup>rd</sup> Column	1x1500MVA, 765/400kV 765kV ICT bay-1 400kV ICT bay-1	Deleted from scheme.

2.2.3. Empowered Committee in its 4<sup>th</sup> meeting agreed with the modifications proposed.

2.2.4. Members may please note.

### 3. Denotification/Dropping of the Transmission Scheme “ Connectivity System for Lanco Vidarbha Thermal Power Pvt. Ltd. (LVTPPL) and Inter State Transmission system strengthening in Chhattarpur area in Madhya Pradesh”

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- 3.1 The implementation of the Inter State Transmission system strengthening in Chhattarpur area in Madhya Pradesh was taken as a part of the transmission scheme “Connectivity System for Lanco Vidarbha Thermal Power Pvt. Ltd. (LVTPPL) and Inter State Transmission system strengthening in Chhattarpur area in Madhya Pradesh” through TBCB route with PFCCL as the Bid Process Coordinator for the scheme.
- 3.2 Empowered Committee in its 37th meeting held on 20.09.2017 decided that the bidding process for the scheme may be taken up after resolution of financial issue and after ascertaining the progress of the project.
- 3.3 In the 2<sup>nd</sup> NCT (National Committee on Transmission) meeting held on 04.12.2018, the progress of the transmission scheme “Connectivity System for Lanco Vidarbha Thermal Power Pvt. Ltd. (LVTPPL) and Inter State Transmission system strengthening in Chhattarpur area in Madhya Pradesh” was reviewed. In the meeting CEA had stated that there was no progress in resolution of financial issue by the developer of LVTPPL, therefore, the bidding of the scheme is still on hold. The scheme would be put up in the next WRSCT and based on the deliberations, the bidding process of the scheme could be resumed with the reduced scope of works.
- 3.4 Accordingly, in the 2<sup>nd</sup> meeting of WRSCT held on 21.05.2019, the transmission scheme “Inter State Transmission system strengthening in Chhattarpur area in Madhya Pradesh” was discussed and it was agreed to drop the transmission scheme.

3.5 Members may like to deliberate.

#### 4. Status of transmission schemes under bidding process - briefing by BPCs

PFCCL and RECTPCL may give brief about the status of transmission projects awarded through TBCB route by them.

Members may like to note.

#### 5. Cost estimates for the transmission projects to be implemented through tariff based competitive bidding (TBCB)

- 5.1 In the 3<sup>rd</sup> meeting of NCT held on 1<sup>st</sup> March,2019, Cost Committee was reconstituted with the representatives from CEA, Powergrid / CTU and BPCs to work out a cost matrix for different transmission schemes based on survey report of BPCs.
- 5.2 The cost committee met two times i.e on 14.03.2019 and 06.06.2019 and worked out the cost of the following transmission schemes based on the preliminary route survey carried out by the BPCs:

Sl. No.	Independent Transmission Projects	Estimated Cost of the Project as per Cost Committee (including RoW compensation) (in Rs. Crore)
1.	Western Region Strengthening Scheme –XIX (WRSS-	1223.24

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Sl. No.	Independent Transmission Projects	Estimated Cost of the Project as per Cost Committee (including RoW compensation) (in Rs. Crore)
	XIX) and North Eastern Region Strengthening Scheme – IX (NERSS-IX) – PFCCL (BPC)	
2.	400 kV Udipi (UPCL) – Kasargode D/C Line-RECTPCL (BPC)	754.87
3.	Western Region Strengthening Scheme – 21 (WRSS-21) Part-A - Transmission System Strengthening for relieving over loadings observed in Gujarat Intra-State System due to RE Injections in Bhuj PS - RECTPCL (BPC)	1089.89
4.	WRSS-21 Part-B - Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS- PFCCL (BPC)	2002.56
5.	Transmission System for providing connectivity to RE projects at Bhuj-II (2000MW) in Gujarat - PFCCL (BPC)	1409.17
6.	Transmission system associated with LTA applications from Rajasthan SEZ Part-D - PFCCL (BPC)	1630.58
7.	Transmission system associated with LTA application from Rajasthan SEZ (Part -C) - RECTPCL (BPC)	1448.15

## 6. New Inter-State Transmission Schemes in Western Region

### 6.1. Transmission schemes for evacuation of Power from potential Solar and Wind Energy Zones ( 17.5 GW) in Western Region under Phase-II

In the 2<sup>nd</sup> meeting of WRSCT held on 21.05.2019, following transmission schemes for evacuation of 17.5 GW (17 GW Solar + 0.5 GW Wind) RE in Western Region under Phase-II of “ Transmission schemes for Integration of 66.5 GW RE into ISTS “ has been agreed .

#### 6.1.1. Name of the Scheme: Transmission System for evacuation of power from RE projects in Rapar (3000 MW) and Lakadia SEZ – Part A

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Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 765/400 kV, 3x1500 MVA & 400/220kV, 6x500MVA Kutch(Rapar) SEZ Pooling Point with 765kV (1x330MVAR) and 400kV (125 MVAR) bus reactor	765/400 kV, 1500 MVA ICT – 3 400/220 kV, 500 MVA ICT – 6  765/400 kV, 500 MVA spare ICT (1-phase) – 1  765 kV ICT bays – 3 400 kV ICT bays – 9 220 kV ICT bays – 6 765 kV line bays – 6 220 kV line bays - 12 330 MVAR, 765 kV reactor 125 MVAR, 420 kV reactor 765 kV reactor bay – 1 420 kV reactor bay – 1  110 MVAR, 765 kV, 1 ph Reactor (spare unit) -1	652.07
2.	Kutch (Rapar) SEZ PP - Ahmedabad 765kV D/c line	Length – 250	1171.05
3.	765 kV, 240 MVAR	765 kV, 240 MVAR reactor – 4	121.6

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	switchable line reactor on each circuit at both ends of Kutch (Rapar) SEZ PP - Ahmedabad 765kV D/c line	nos. 765 kV, 80 MVAr reactor (1-ph ) spare unit – 1 no at Rapar end Switching equipments for line reactor- 4	
4.	2 no. of 765 kV line bays at Ahmedabad for Kutch (Rapar) SEZ PP - Ahmedabad 765kV D/c line	765 kV line bays – 2	40.03
5.	LILO of Lakadia – Banaskantha 765kV D/c line at Kutch (Rapar) SEZ PP	Length - 70	327.89
		<b>Total</b>	<b>2312.62</b>

#### 6.1.2. Name of the Scheme: Transmission System for evacuation of power from RE projects in Rapar (3000 MW) and Lakadia SEZ – Part B



Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 765/400kV,	765/400 kV, 1500 MVA ICT –	263.29

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	<p>2X1500 MVA at suitable location near Ahmedabad (towards eastern side of Ahmedabad) with 765kV (1x330MVAR) and 400kV (125 MVAR) bus reactor</p> <p><u>Future provisions:</u> Space for 765/400kV ICTs along with bays: 4 nos. 400/220kV ICTs along with bays: 4 nos. 765kV line bays: 6 nos. 400kV line bays: 8 nos. 220kV line bays: 8 nos. 765kV bus reactor along with bays: 1no 400kV bus reactor along with bays: 1no</p>	<p>2</p> <p>765/400 kV, 500 MVA spare ICT (1-phase) – 1</p> <p>765 kV ICT bays – 2 400 kV ICT bays – 2 765 kV line bays – 2</p> <p>330 MVA<sub>r</sub> , 765 kV reactor 125 MVA<sub>r</sub>, 420 kV reactor 765 kV reactor bay – 1 420 kV reactor bay – 1</p> <p>110 MVAR, 765 kV, 1 ph Reactor (spare unit) -1 (<i>for both 1x 330 MVA<sub>r</sub> bus reactor and 1x330 MVA<sub>r</sub> line reactor on Ahmedabad – Indore 765 kV D/c line</i>)</p>	
2.	Ahmedabad – Indore 765 kV D/c line	Length - 370	1733.15
3.	2 no. of 765 kV line bays at Indore for termination of Ahmedabad – Indore 765 kV D/c line	765 kV line bays – 2	40.03
4.	<b>330 MVA<sub>r</sub>, 765 kV switchable Line reactor for each circuit at both ends of Ahmedabad – Indore 765 kV D/c line</b>	<p>330 MVA<sub>r</sub>, 765 kV Reactor - 4 Switching equipments for 765 kV reactor - 4</p> <p>80 MVAR, 765 kV, 1 ph switchable line Reactor (spare unit) at Ahmedabad end -1 (<i>for 240 MVA<sub>r</sub> line reactor on Kutch (Rapar) SEZ PP - Ahmedabad 765kV D/c line</i>)</p>	131.57
		<b>Total</b>	<b>2168.04</b>

6.1.3. **Name of the Scheme: Transmission System for evacuation of power from RE projects in Rapar (3000 MW) and Lakadia SEZ – Part B(Ahmedabad 400 kV interconnection).**

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Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	LILO of Pirana(T) – Pirana(PG) 400kV D/c line at Ahmedabad with twin HTLS along with reconductoring of Pirana – Pirana(T) line with twin HTLS conductor	Length – 44 Reconductoring length - 6	81.39
2.	4 nos. of 400 kV line bays at Ahmedabad for termination of LILO of Pirana(T) – Pirana(PG) 400kV D/c line at Ahmedabad with twin HTLS	400 kV line bays – 4	35.96
		Total	117.35

6.1.4. Name of the Scheme: Transmission System for evacuation of power from RE projects in Banaskantha (2500 MW) REZ.



Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
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I/6252/2019

1.	Augmentation of transformation capacity at Radhanesda PS by 5X500 MVA, 400/220kV ICTs for interconnection with SEZ	400/220 kV, 500 MVA ICT – 5 400 kV ICT bays – 5 220 kV ICT bays – 5 400 kV line bays – 2 220kV line bays- 10 nos	215.56
2.	Radhanesda PS - Banaskantha 400 kV D/c line (Twin HTLS)	Length – 95	161.34
3.	Banaskantha –Zerda 400 kV D/c line	Length – 50	75.48
4.	4 no. of 400 kV line bays at Banaskantha For both Radhanesda PS - Banaskantha 400 kV D/c line (Twin HTLS) and Banaskantha –Zerda 400 kV D/c line	400 kV line bays – 4	35.96
5.	2 no. of 400 kV line bays at Zerda for Banaskantha – Zerda 400 kV D/c line	400 kV line bays -2	17.98
		<b>Total</b>	<b>506.33</b>

**6.1.5. Name of the Scheme: Augmentation of transformation capacity at Lakadia PS for providing connectivity to RE projects (2000 MW)**

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Augmentation of transformation capacity at Lakadia PS by 1x1500MVA, 765/400kV and 4x500MVA, 400/220kV ICTs for interconnection with SEZ	765/400 kV, 1500 MVA ICT – 1 400/220 kV, 500 MVA ICT – 4 765 kV ICT bays – 1 400 kV ICT bays – 5 220 kV ICT bays – 4 220 kV line bays - 8	229.69
		<b>Total</b>	<b>229.69</b>

*Note: 4x500MVA, 400/220kV ICTs for interconnection with SEZ to be implemented only in case injection from RE projects at 220 kV level at Lakadia. Not required in case injection is directly at 400 kV level.*

**6.1.6. Name of the Scheme: Transmission System for evacuation of power from RE projects in at Jamnagar (2500 MW) REZ- Part A**

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Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 400/220 kV, 5X500 MVA at Lalpur (Jamnagar) SEZ PP with 400kV (125 MVAR) bus reactor  <u>Future provisions:</u> Space for 400/220kV ICTs along with bays: 3 nos. 400kV line bays: 4 nos. 220kV line bays: 6 nos 400kV bus reactor along with bays: 1 no	400/220 kV, 500 MVA ICT – 5  400 kV ICT bays – 5 220 kV ICT bays – 5 400 kV line bays – 6 220kV line bays-10  125 MVAr, 420 kV reactor 420 kV reactor bay – 1	269.08
2.	Lalpur (Jamnagar) SEZ PP - Rajkot 400 kV 2xD/c line (Twin HTLS)	Length - 200	339.66
3.	4 no. of 400 kV line bays at Rajkot for Lalpur (Jamnagar) SEZ PP - Rajkot 400 kV 2xD/c line	400 kV line bays – 4	35.96
4.	Lalpur (Jamnagar) SEZ PP – Jam Khamabliya PS 400 kV D/c line (Twin HTLS)	Length - 50	84.92
5.	2 no. of 400 kV line bays at Jam Khamabliya PS for Lalpur (Jamnagar) SEZ PP – Jam Khamabliya PS 400 kV D/c line (Twin HTLS)	400 kV line bays – 2	17.98
		<b>Total</b>	<b>747.60</b>

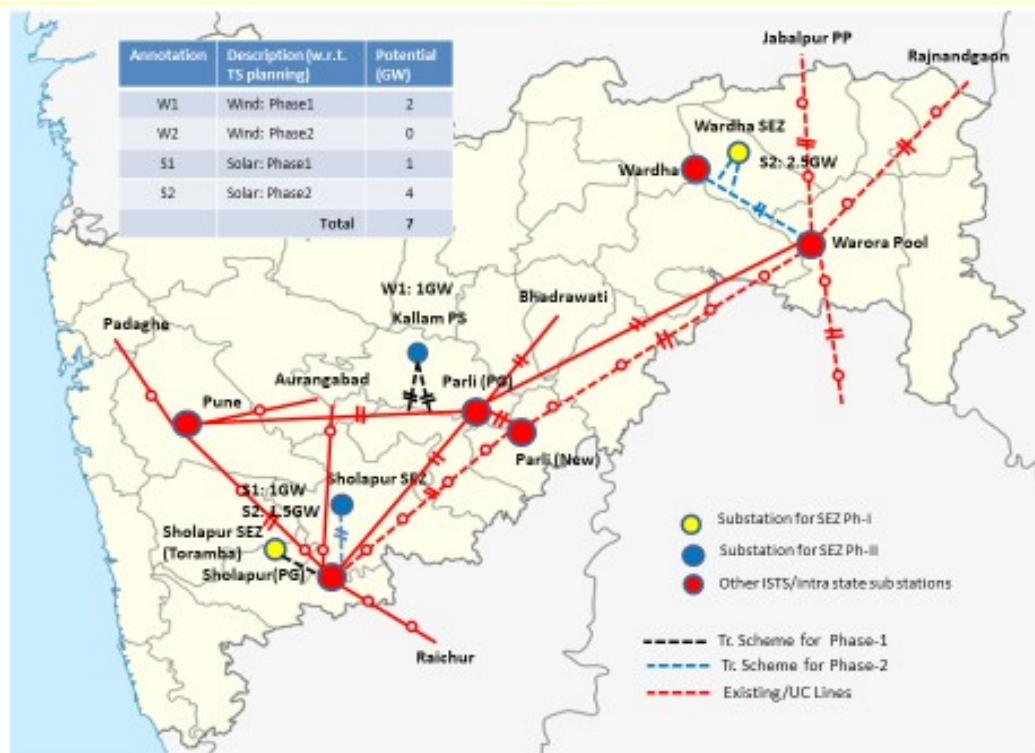
**6.1.7. Name of the Scheme: Transmission System for evacuation of power from RE projects in at Jamnagar (2500 MW) REZ- Part B**

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Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 400kV switching station at Rajkot with 420 kV (125 MVAR) bus reactor  <u>Future provisions:</u> Space for 400/220kV ICTs along with bays: 4 nos. 400kV line bays: 4 nos. 220kV line bays: 10 nos 400kV bus reactor along with bays: 1no	400 kV line bays – 6  125 MVAR, 420 kV reactor 420 kV reactor bay – 1	71.49
2.	LILO of CGPL-Jetpur 400 kV D/C(triple) at Rajkot	Length – 40	67.93
3.	Rajkot – Ahmedabad 400 kV D/c line (Twin HTLS)	Length – 230	390.61
4.	2 no. of 400 kV line bays at Ahmedabad for Rajkot – Ahmedabad 400 kV D/c line (Twin HTLS)	400 kV line bays – 2	17.98
5.	63 MVAR, 400 kV switchable line reactor on each circuit at both ends of Rajkot – Ahmedabad 400 kV D/c line (Twin HTLS)	63 MVAR, 420 kV Reactor - 4 Switching equipments for 400 kV reactor- 4	46
		<b>Total</b>	<b>594.02</b>

6.1.8. **Name of the Scheme: Transmission system for evacuation of power from RE projects in Sholapur (1000 MW under Ph-I+ 500 MW under Ph-II) SEZ in Maharashtra.**

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Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (Rs.) Cr.
1.	Establishment of 400/220 kV, 3x500 MVA at Solapur PP (near Mohol)	500MVA, 400/220kV ICT -3 400kV ICT bay -3 220kV ICT bay -3 400kV line bay -2 220 kV line bays- 6	144.94
2.	Solapur pooling point - Solapur (PG) 400 kV D/c line (twin HTLS)	50km	94
3.	2 nos. of 400kV bays at Solapur PS for Solapur pooling point - Solapur (PG) 400 kV D/c line	400kV line bay -2	19
4.	1x125 MVAR, 420 kV Bus Reactor at Solapur PP	1x125 MVAR, 420kV bus reactor 420kV reactor bay	18
<b>Total Rs (in Crore)</b>			<b>275.94</b>

6.1.9. Name of Scheme: Transmission system for evacuation of power from RE projects in wind energy zones in Osmanabad area of Maharashtra ( 1 GW)

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.)
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			Cr.
1.	Establishment of 2x500MVA, 400/220kV near Kallam PS	2x500MVA, 400/220kV 400kV ICT bay-2 220kV ICT bay-2 400kV line bay-4 220kV line bay- 4	179
2.	1x125MVA bus reactor at Kallam PS	1x125 MVA 400kV reactor bay -1	18
3.	LILLO of both circuits of Parli(PG) – Pune(GIS) 400kV D/c line at Kallam PS	10km	55
4.	Conversion of 50MVA fixed Line Reactors on each ckt of Parli (PG) – Pune (GIS) 400kV D/c line at Parli (PG) end into switchable.	400kV Reactor bays -2	19
5.	Provision of new 50MVA switchable line reactor at Kallam PS end of Kallam – Pune(GIS) 400kV D/c line	2x50 MVA 400kV Reactor bays -2	30
Total Rs (in Crore)			301

Note:

- The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey.
- Powergrid to provide space at Parli (PG) for Conversion of 50MVA fixed Line Reactors on each ckt of Parli (PG) – Pune (GIS) 400kV D/c line at Parli (PG) end into switchable.

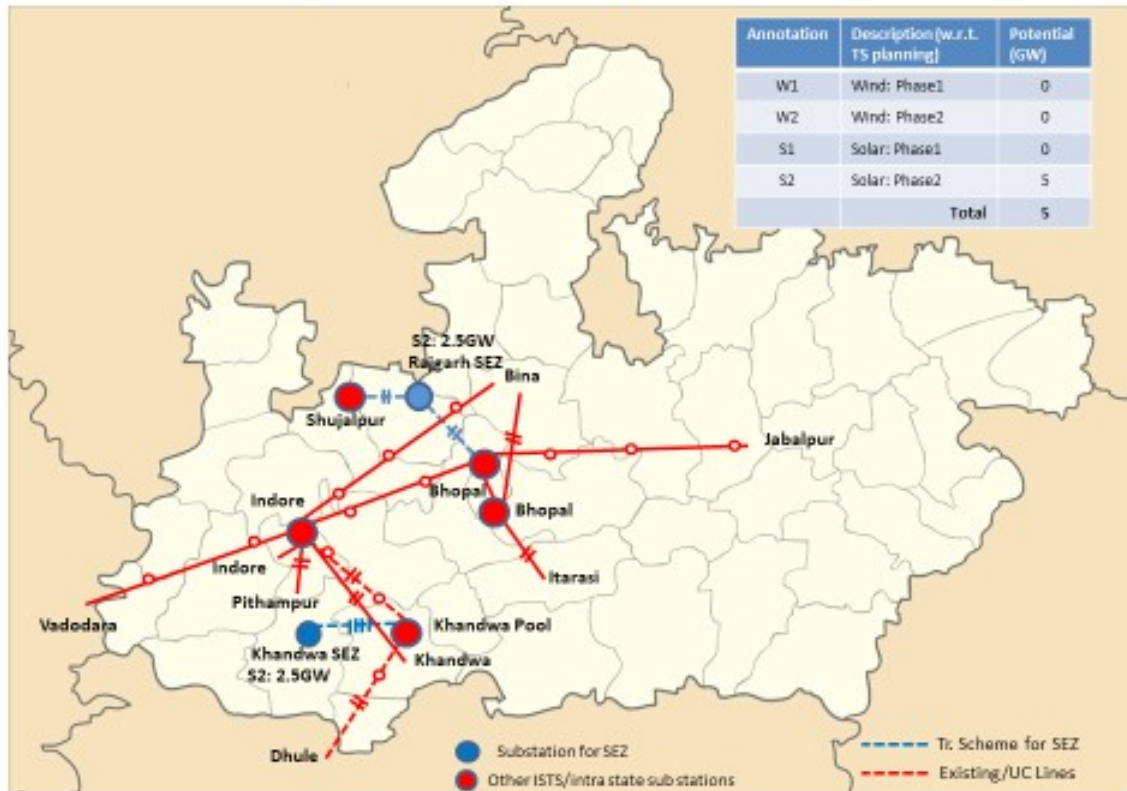
#### 6.1.10. Name of the Scheme: Transmission system for evacuation of power from RE projects in Wardha (2500 MW) SEZ in Maharashtra

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 400/220 kV, 5X500 MVA at Wardha SEZ PP with 400kV (125 MVAR) bus reactor  <u>Future provisions:</u> Space for 400/220kV ICTs along with bays: 3 nos. 400kV line bays: 4 nos. 220kV line bays for interconnection of solar projects: 16 nos 400kV bus reactor along with bays: 1no	400/220 kV, 500 MVA ICT – 5  400 kV ICT bays – 5 220 kV ICT bays – 5 400 kV line bays – 4 220 kV line bays - 10  125 MVA, 420 kV reactor 420 kV reactor bay – 1	251.09

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2.	LILO of Wardha - Warora Pool 400 kV D/c (Quad) line at Wardha SEZ PP	Length - 85	219.84
		<b>Total</b>	<b>470.93</b>

6.1.11. Name of the Scheme: Transmission system for evacuation of power from RE projects in Rajgarh (2500 MW) SEZ in Madhya Pradesh



Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 400/220 kV, 5X500 MVA at Rajgarh SEZ PP with 420kV (125 MVAR) bus reactor  Future provisions: Space for 400/220kV ICTs along with bays: 3 nos. 400kV line bays: 6 nos. 220kV line bays: 16 nos 400kV bus reactor along with bays: 1 no	400/220 kV, 500 MVA ICT – 5  400 kV ICT bays – 5 220 kV ICT bays – 5 400 kV line bays – 4 220 kV line bays - 10  125 MVAR, 420 kV reactor 420 kV reactor bay – 1	251.09
2.	Rajgarh SEZ PP -Bhopal (Sterlite) 400 kV D/c line	Length – 130	220.78

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	(HTLS)		
3.	2 no. of 400 kV line bays at Bhopal (Sterlite) for Rajgarh SEZ PP -Bhopal (Sterlite) 400 kV D/c line (HTLS)	400 kV line bays – 2	17.98
4.	Rajgarh SEZ PP – Shujalpur 400 kV D/c line (HTLS)	Length -80	135.86
5.	2 no. of 400 kV line bays at Shujalpur for Rajgarh SEZ PP – Shujalpur 400 kV D/c line (HTLS)	400 kV line bays – 2	17.98
		<b>Total</b>	<b>643.70</b>

**6.1.12. Name of the Scheme: Transmission system for evacuation of power from RE projects in Khandwa (2500 MW) in Madhya Pradesh**

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 400/220 kV, 5X500 MVA at Khandwa SEZ PP with 420kV (125 MVAR) bus reactor  Future provisions: Space for 400/220kV ICTs along with bays: 3 nos. 400kV line bays: 4 nos. 220kV line bays: 16 nos 400kV bus reactor along with bays: 1no	400/220 kV, 500 MVA ICT – 5  400 kV ICT bays – 5 220 kV ICT bays – 5 400 kV line bays – 4 220 kV line bays - 10  125 MVAr, 420 kV reactor 420 kV reactor bay – 1	251.09
2.	Khandwa SEZ PP - Khandwa Pool 400 kV 2XD/c line (Twin HTLS)	Length – 100	169.83
3.	4 no. of 400 kV line bays at Khandwa Pool for Khandwa SEZ PP - Khandwa Pool 2XD/c line (Twin HTLS)	400 kV line bays – 4	35.96
		<b>Total</b>	<b>456.89</b>

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**6.1.13. Name of the Scheme: Transmission system for evacuation of power from RE projects in Khandwa (2500 MW) in Madhya Pradesh – ICT augmentation at Khandwa Pool**

<b>Sl. No.</b>	<b>Scope of the Transmission Scheme</b>	<b>Capacity /km</b>	<b>Estimated Cost (in Rs Cr)</b>
<b>1.</b>	Augmentation of 1X1500 MVA, 765/400kV ICT at Khandwa Pool (Sterlite)	765/400 kV, 1500 MVA ICT – 1 765 kV ICT Bays- 1 400 kV ICT Bays -1	72.79
		<b>Total</b>	<b>72.79</b>

**6.1.14. Name of the Scheme: Transmission System for providing immediate connectivity to Dholera UMSP (4000 MW)**



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Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 765/400kV, 3X1500 MVA at Dholera Pooling station with 765kV (1x330MVAR) and 400kV (125 MVAR) bus reactor	765/400 kV, 1500 MVA ICT – 3  765/400 kV, 500 MVA spare ICT (1-phase) – 1  765 kV ICT bays – 3 400 kV ICT bays – 3 765 kV line bays – 6 400 kV line bays - 6  330 MVA, 765 kV reactor 125 MVA, 420 kV reactor 765 kV reactor bay – 1 420 kV reactor bay – 1  110 MVA, 765 kV, 1 ph Reactor (spare unit) -1	468.92
2.	LILO of Lakadia – Vadodara 765 kV D/c line at Dholera UMSP	Length -40	187.37
3.	Dholera UMSP – Ahmedabad 765kV D/c line	Length - 100	468.42
4.	2 no. of 765 kV line bays at	765 kV line bays – 2	40.03

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	Ahmedabad for termination of Dholera UMSP – Ahmedabad 765kV D/c line		
5.	765 kV, 240 MVA switchable line reactor at Dholera PS end on each circuit of Dholera – Ahmedabad 765kV D/c line	240 MVA, 765 kV line Reactor- 2 Switching equipments for Line Reactor- 2  1x80 MVA, 765 kV switchable line reactor (1-ph), spare unit – 1 (at Dholera end)	63.90
		<b>Total</b>	<b>1228.64</b>

**6.2. Name of the Scheme: Conversion of 80 MVA fixed line reactor at Boisar end of Aurangabad- Boisar 400 kV D/c line to switchable line reactor alongwith NGR bypass arrangement**

6.2.1. MSETCL’s proposal for “Establishment of 400/220 kV Intra State substation at Pimpalgaon (Nashik) by MSETCL” was agreed in the 2<sup>nd</sup> meeting of WRSCT held on 21.05.2019. The above proposal inter-alia involves LILO of Aurangabad-Boisar 400 kV D/C quad line at proposed 400/220 kV, 2X500 MVA Pimpalgaon S/stn , which is an ISTS line. With LILO Boisar- Pimpalgaon section length gets reduced and the associated line reactors at Boisar were agreed to be converted to switchable. Accordingly, the following transmission element under the scheme was agreed to be implemented as Inter State Transmission Scheme:

Sl. No.	Scope of the Transmission Scheme	Capacity	Estimated Cost (Rs.) Cr
1.	Conversion of 80 MVA fixed line reactor at Boisar end of Aurangabad- Boisar 400 kV D/c line to switchable line reactor alongwith NGR bypass arrangement	400 kV Switching equipments for line reactor-2	8.9

**6.3. Name of the Scheme: Connectivity system for NTPC Lara STPP 2x800MW Stage-II generation project**

6.3.1. The transmission scheme “Connectivity system for NTPC Lara STPP 2x800MW Stage-II generation project” was agreed in the 2<sup>nd</sup> meeting of WRSCT held on 21.05.2019. The transmission scheme inter-alia includes the following transmission element to be implemented under ISTS:

Sl.	Scope of the Transmission Scheme	Capacity /ckm	Estimated
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No.			Cost (Rs.) Cr.
1.	Reconductoring of Lara STPP I – Raigarh (Kotra) 400kV D/c line with HTLS conductor (Quad Moose capacity)	20	
	<b>Total Rs (in Crore)</b>		

#### 6.4. Name of the Scheme: Navsari (PG) – Bhestan/Popada (GETCO) 220 kV D/C line

6.4.1. Navsari (PG) – Bhestan/Popada (GETCO) 220 kV D/C line was planned as a part of the transmission scheme “**Transmission System associated with DGEN TPS (1200 MW) of Torrent Power Ltd.**” which was awarded to M/s Instalaciones Inabensa through TBCB route. The implementation schedule of the scheme was 38 months i.e. May, 2018. M/s DGENTPL has not taken up the implementation of the scheme.

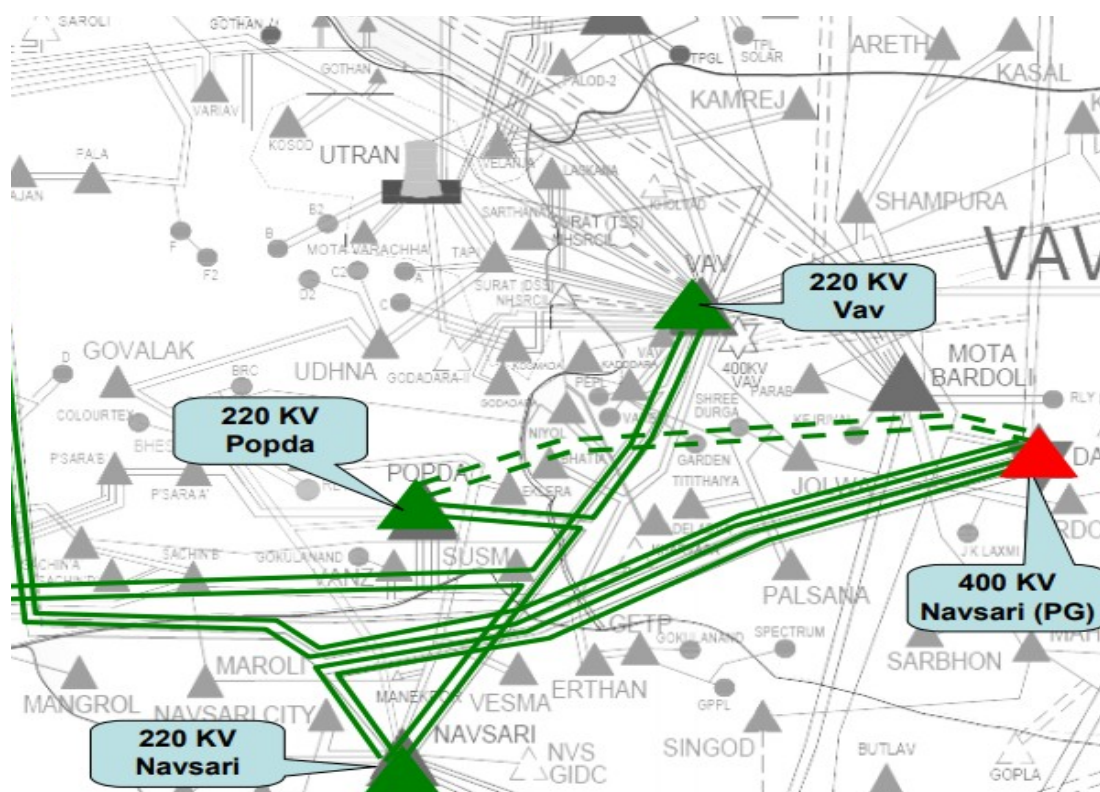
6.4.2. The issue of non-implementation of scheme by M/s DGENTPL has been deliberated in earlier standing committee meetings as well as separate meetings.

6.4.3. In the 2<sup>nd</sup> meeting of WRSCT held on 21.05.2019, in view of consistent overloading observed on Vav-Popadiya/Sachin-Navsari (GETCO)- Navsari (PGCIL) 220 kV lines, members agreed to delink the line from “Transmission System associated with DGEN TPS (1200 MW) of Torrent Power Ltd.” and take up the implementation of Navsari (PG) – Bhestan 220 kV D/C line as a separate ISTS scheme.

The scope of works of the transmission scheme is as follows:

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs.) Cr.
1.	Navsari (PG) – Bhestan 220 kV D/C line (with minimum capacity of 400MVA per circuit)	40	
2.	Associated 220 kV line bays at Navsari 400/220 kV (PGCIL) substation and Bhestan 220 kV substation has already been implemented by POWERGRID and GETCO respectively.		
	<b>Total Rs (in Crore)</b>		

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## 7. New Inter-State Transmission Schemes in Southern Region

- 7.1. Transmission system for evacuation of power from Phase-II Solar Energy Zones in Andhra Pradesh and Karnataka were agreed to be implemented as ISTS system in the 2<sup>nd</sup> SRSCT held on 10.06.2019 at Bengaluru.

While approving these schemes, the SRSCT mentioned that these transmission system are a broad master plan to serve integration of RE generation potential assessed in Tamil Nadu, Karnataka and Andhra Pradesh for period upto 2021-22. As such, it was agreed that the scheme would be implemented as ISTS, consequent to grant of LTA by CTU. The transformation capacity at various sub-stations and certain elements may be required to be reviewed based on LTA applications.

### 7.1.1. Name of the Scheme: Transmission scheme for Solar Energy Zone in Ananthpuram (Ananthapur) (2500 MW) and Kurnool (1000 MW) , Andhra Pradesh

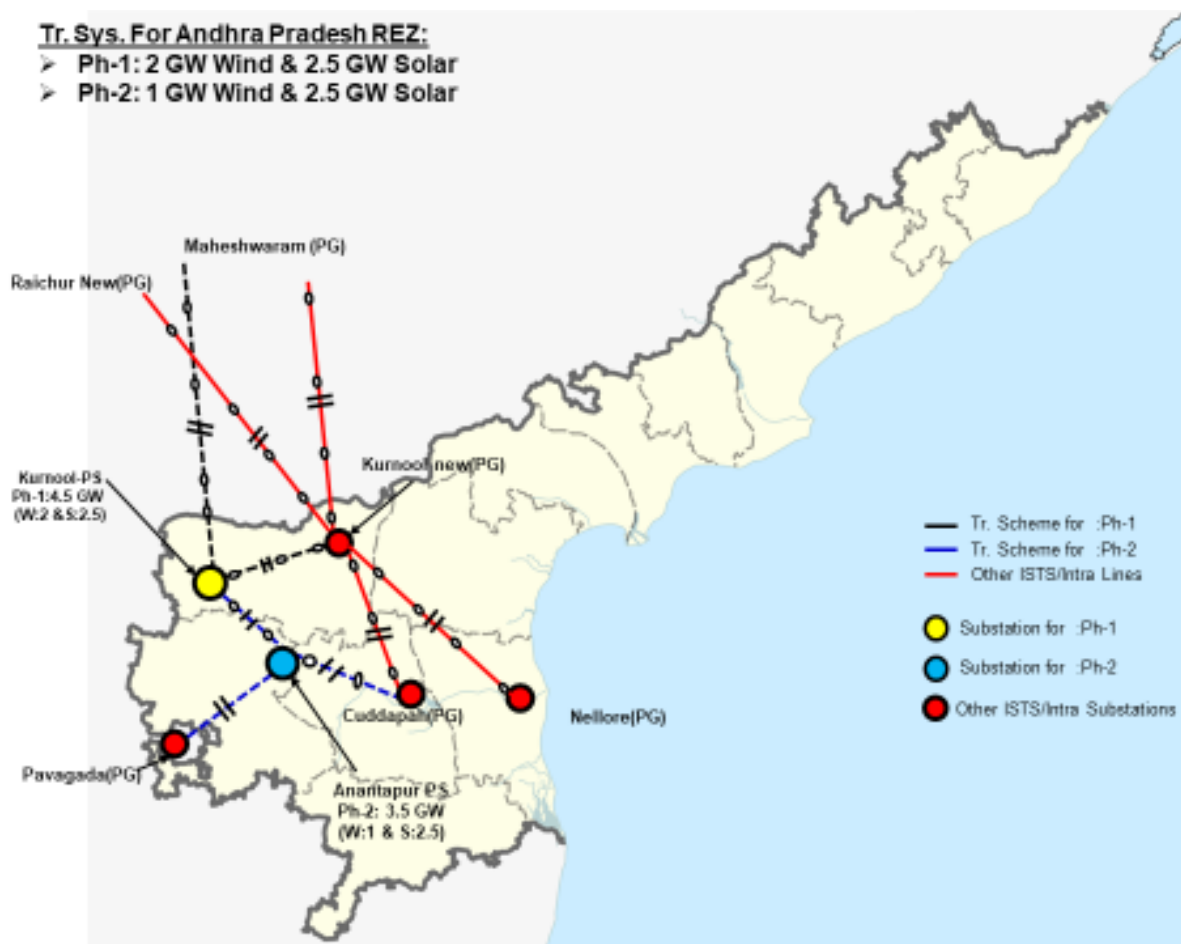
Sl. No.	Scope of the Transmission Scheme	Capacity /km	Cost
1.	Establishment of 400/220 kV, 7x500 MVA pooling station at suitable border location between Ananthpuram & Kurnool Distt with 400kV (2x125 MVAR) bus reactor  <u>Future provisions:</u> Space for 400/220kV ICTs along with bays: 1	400/220 kV, 500 MVA ICT – 7  400 kV ICT bays – 7 220 kV ICT bays – 7 400 kV line bays – 4 220 kV line bays – 12  125 MVA, 420 kV reactor - 2	339.46

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	nos. 400kV line bays: 6 nos. 220kV line bays: 4 nos.	420 kV reactor bay – 2	
2.	Ananthpuram PS-Kurnool-III PS 400 kV (High capacity equivalent to quad moose) D/c Line	Length – 100	169.83
3.	400 kV line bays at Kurnool-III PS for Ananthpuram PS-Kurnool-III PS 400 kV D/c line	400 kV line bays – 2	17.98
4.	Ananthpuram PS-Cuddapah 400 kV (High capacity equivalent to quad moose) D/c Line	Length - 150	254.75
5.	400 kV line bays Cuddapah PS for Ananthpuram PS-Cuddapah 400 kV	400 kV line bays – 2	17.98
6.	80 MVAR, 420 KV switchable line reactor for Ananthpuram PS-Cuddapah 400 kV D/c line	420 kV, 80 MVAR reactor – 2 nos. Switching equipments for line reactor- 2	8.91
		<b>Total</b>	<b>823</b>

**Tr. Sys. For Andhra Pradesh REZ:**

- Ph-1: 2 GW Wind & 2.5 GW Solar
- Ph-2: 1 GW Wind & 2.5 GW Solar



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## 7.1.2. Name of the Scheme: Transmission Scheme for Solar Energy Zone in Gadag (2500 MW), Karnataka

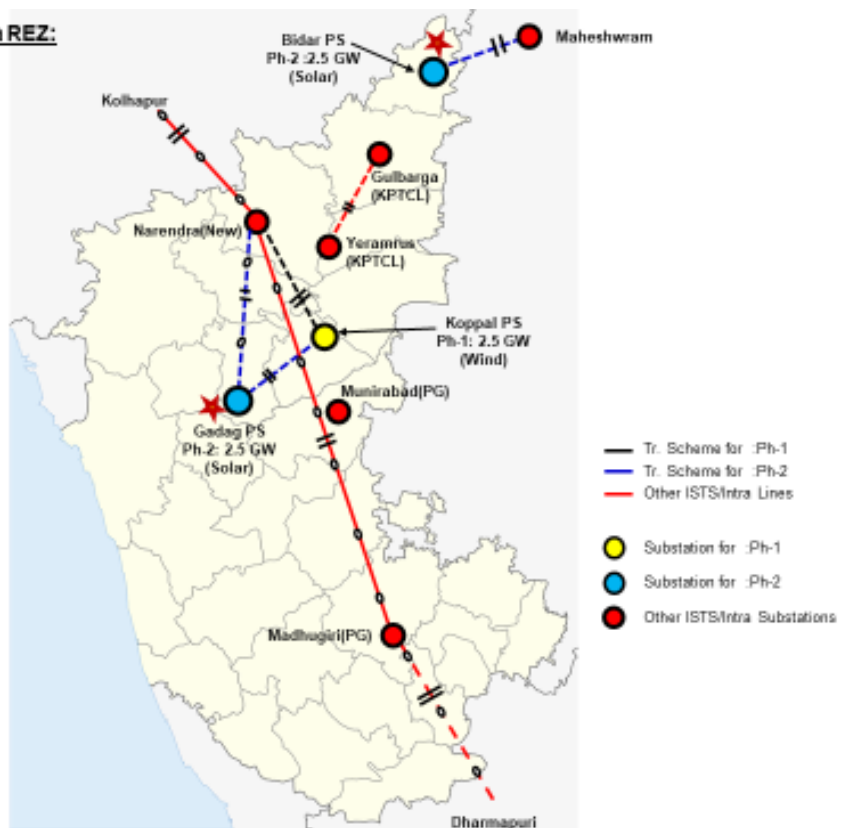
Sl. No.	Scope of the Transmission Scheme	Capacity /km	Cost in Rs cr.
1.	Establishment of 400/220 kV, 5x500 MVA Gadag Pooling Station with 400kV (1x125 MVAR) bus reactor  <u>Future provisions:</u> Space for 400/220kV ICTs along with bays: 1 nos. 400kV line bays: 6 nos. 220kV line bays: 4 nos	400/220 kV, 500 MVA ICT – 5  400 kV ICT bays – 5 220 kV ICT bays – 5 400 kV line bays – 4 220 kV line bays – 8  125 MVAr, 420 kV reactor - 1 420 kV reactor bay – 1	242.87
2.	Gadag PS-Koppal PS 400 kV (high capacity equivalent to quad moose) D/C Line	Length – 60	101.9
3.	400 kV line bays at Koppal PS for Gadag PS-Koppal PS 400 kV D/c line	400 kV line bays – 2	17.98
4.	Gadag PS-Narendra (New) PS 400 kV (high capacity equivalent to quad moose) D/C Line	Length - 100	169.83
5.	400 kV line bays Narendra (new) for Gadag PS-Narendra (New) PS 400 kV D/c line	400 kV line bays – 2	17.98
6.	Upgradation of Narendra (New) to its rated voltage of 765 kV level along with 2x1500 MVA, 765/400 kV transformer and 765 kV, 1x330 MVAr Bus Reactor	765/400 kV, 1500 MVA ICT – 2  765 kV ICT bays – 2 400 kV ICT bays – 2 765 kV line bays – 2  330 MVAr, 765 kV reactor - 1 765 kV reactor bay – 1 500 MVA/ 765/400 kV 1-phase ICT (spare unit) – 1 110 MVAR, 765 kV, 1 ph Reactor (spare unit) -1 (for both the bus reactor and 1X330 MVAr line reactor on Madhugiri (Tumkur) - Narendra New 765 kV D/c line)	245.74
7.	Upgradation of Kolhapur (PG) to its rated voltage of 765 kV level alongwith	765/400 kV, 1500 MVA ICT – 2  765 kV ICT bays – 2	245.74

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	2x1500 MVA, 765/400 kV transformer and 765 kV, 1x330 MVAr Bus Reactor	400 kV ICT bays – 2 765 kV line bays – 2  330 MVAr, 765 kV reactor - 1 765 kV reactor bay – 1  500 MVA/ 765/400 kV 1-phase ICT (spare unit) – 1 110 MVAR, 765 kV, 1 ph Reactor (spare unit) -1 (for both the bus reactor and 1X330 MVAr line reactor on Narendra new - Kolhapur (PG) 765 kV D/c line )	
8	Upgradation/charging of Narendra new - Kolhapur (PG) 765 kV D/c line (initially charged at 400 kV) to its rated voltage of 765 kV		
9	1x330 MVAr, 765 KV switchable Line Reactor on Kolhapur (PG) end of each circuit of Narendra new - Kolhapur (PG) 765 kV D/c line	765 kV, 330 MVAr line reactor – 2 nos.  Switching equipments for line reactor- 2	62.37
		<b>Total</b>	<b>1104.43</b>

**Tr. Sys. For Karnataka REZ:**

- Ph-1: 2.5 GW Wind
- Ph-2: 5 GW Solar



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7.1.3. **Name of the scheme: Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka**

Sl. No.	Scope of the Transmission Scheme	Capacity /ckm	Cost in Rs cr.
1	Establishment of 3x1500MVA (765/400kV), 5x500MVA (400/220kV) station at suitable border location near Bidar.with 765kV (1x240 MVAR) and 400kV (1x125 MVAR) bus reactor  <u>Future provisions:</u> Space for 765/400kV ICTs along with bays: 1 no. 400/220kV ICTs along with bays: 2 nos. 765kV line bays: 6 nos. 400kV line bays: 8 nos. 220kV line bays: 4 nos. 765kV bus reactor along with bays: 1no	1500MVA, 765/400kV- 3 500MVA , 400/220kV- 5 765kV ICT bay-3 400kV ICT bay-8 220kV ICT bay- 5 765kV line bay-2 220kV line bays -8  1x240MVAr, 765kV - 1 1x125MVAr, 420kV - 1  765kV reactor Bay -1 400kV reactor Bay -1  1x500 MVA, 765/400 kV, 1-ph ICT (spare unit) - 1  1x80 MVAR, 765 kV, 1 ph Reactor (spare unit) – 1 ( for both bus reactor and 240 MVAr line reactor of Bidar PS – Maheshwaram (PG) 765 kV D/C line)	520.65
2	Bidar PS – Maheshwaram (PG) 765 kV D/C line	Length - 160	749.47
3	765 kV line bays at Maheshwaram (PG) for termination of Bidar PS – Maheshwaram (PG) 765 kV D/C line	765 kV line bays - 2	40.03
4	765kV, 1X240MVAr switchable Line reactor for each circuit at Bidar PS end of Bidar PS – Maheshwaram (PG) 765 kV D/C line	240 MVAR, 765 kV line reactor – 2 Switching equipments for line reactor- 2	57.38
		<b>Total</b>	<b>1367.52</b>

7.1.4. **Name of the Scheme: Common transmission system strengthening in Southern Region for enabling evacuation and export of power from Solar & Wind Energy Zones in Southern Region”**



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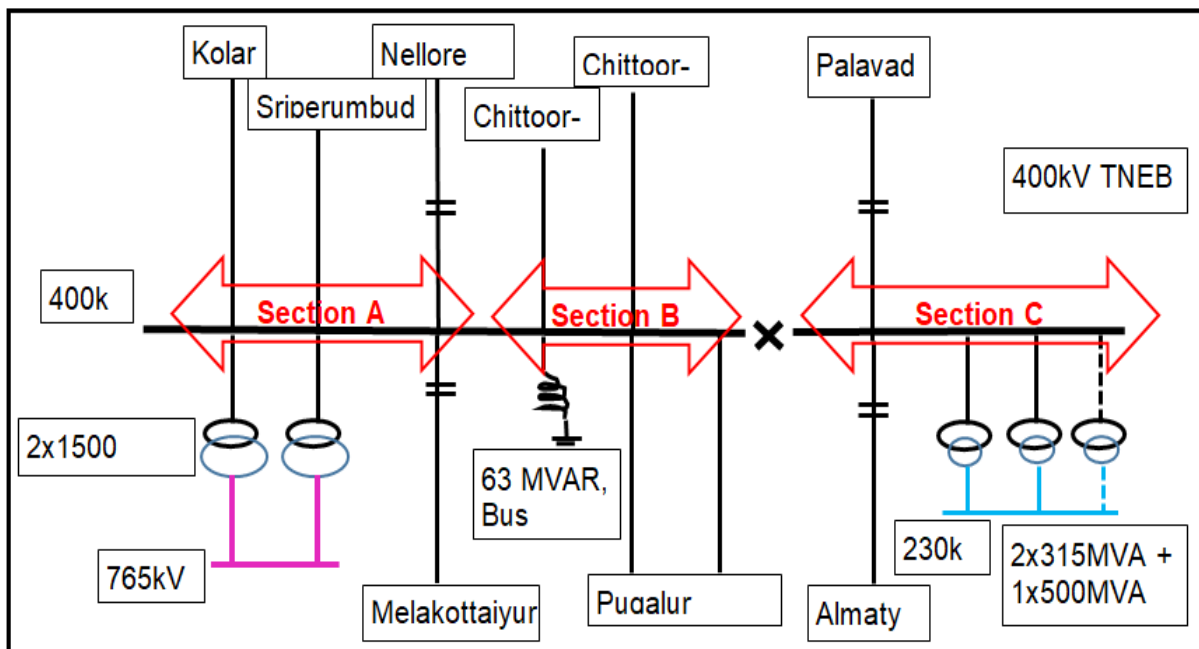
Sl no	Scope of the Transmission Scheme	Capacity / ckm / nos.	Estimated Cost (Rs. Cr.)
1.	<p>(i) Upgradation of Tuticorin PS to its rated voltage of 765kV level alongwith 2x1500 MVA, 765/400kV ICTs and 1x330 MVAr, 765kV Bus Reactor</p> <p>(ii) Upgradation of Dharmapuri (Salem New) to its rated voltage of 765kV level alongwith 2x1500 MVA, 765/400kV ICTs and 1x240 MVAr, 765kV Bus Reactor</p> <p>(iii) Upgradation of Madhugiri (Tumkur) to its rated voltage of 765kV level alongwith 2x1500 MVA, 765/400kV ICTs and 1x240 MVAr, 765kV Bus Reactor</p> <p>(iv) Upgradation/ charging of Tuticorin PS - Dharmapuri (Salem New) 765 kV D/c line (initially charged at 400 kV) to its rated voltage of 765 kV along with 1x330 MVAr switchable Line Reactor on both end of each circuit.</p> <p>(v) Upgradation/charging of Dharmapuri (Salem New) - Madhugiri (Tumkur) 765 kV 2xS/c line (initially charged at 400 kV) to its rated voltage of 765 kV along with 1x330 MVAr switchable Line Reactor on Dharmapuri (Salem New) end of both circuits</p> <p>(vi) Upgradation/ charging of Madhugiri (Tumkur) - Narendra New 765 kV D/c line (initially charged at 400 kV) to its rated voltage of 765 kV along with 1x330 MVAr switchable Line Reactor on both end of each circuit.</p> <p>(vii) Conversion of 400 kV Line Reactors installed on 765 kV circuits/ lines (initially charged at 400 kV) mentioned at Sl No. iv, v and vi into 400 kV bus Reactor with suitable arrangements at respective substations.</p>	<p>1500MVA, 765/400kV - 6</p> <p>765kV ICT bay-6 400kV ICT bay-6 765kV line bay-12 330 MVAr reactor-1 240 MVAr reactor-2 330 MVAr LR-10 Switching equipments for 330 MVAr LR – 10 765kV bus reactor bay-3 400kV bus reactor bay-10</p> <p><b>Spare for Tuticorin PS :</b></p> <p>1x500 MVA, 765/400 kV, 1-ph ICT (spare unit) 1x110 MVAR, 765 kV, 1 ph. Switchable reactor (spare unit) (for 330 MVAr line/bus reactor)</p> <p><b>Spare for Dharmapuri (Salem New):</b></p> <p>1x500 MVA, 765/400 kV, 1-ph ICT (spare unit), 1 ph. Switchable reactor (spare unit) (for 330 MVAr line reactor) &amp;1x80 MVAR, 765 kV, 1 ph. Switchable reactor (spare unit) (for 240 MVAr bus reactor)</p> <p><b>Spare for Madhugiri (Tumkur):</b></p> <p>1x500 MVA, 765/400 kV, 1-ph ICT (spare unit), 1 ph. Switchable reactor (spare unit) (for 330 MVAr line reactor) &amp;1x80 MVAR, 765 kV, 1 ph. Switchable reactor (spare unit) (for 240 MVAr bus reactor)</p>	1202

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Sl no	Scope of the Transmission Scheme	Capacity / ckm / nos.	Estimated Cost (Rs. Cr.)
		Total	1209

### 7.2. Name of the scheme: Transmission system for controlling high Short Circuit Current level at 765/400 kV Thiruvalem S/s

The scheme has been agreed in the 2<sup>nd</sup> SRST for controlling fault level at 400 kV bus of Thiruvalem substation



Sl no	Scope of the Transmission Scheme	Capacity / ckm	Estimated Cost (Rs. Cr.)
2.	a) 12Ω, 420 kV fault limiting bus series reactors between: <ul style="list-style-type: none"> <li>• Bus section-A and bus section-B</li> <li>• Bus Section-B and bus section-C</li> </ul> b) Opening of the one of the bus (other than on which fault limiting bus series reactors are being installed) between the above mentioned bus sections through suitable arrangement.           c) Bypass of Kolar-Thiruvalem and Thiruvalem-Sriperumbudur 400 kV S/c line to form Kolar – Sriperumbudur 400 kV S/c direct line.		

### 7.3. Name of the scheme: Transmission system for controlling High loading of Nellore – Nellore PS 400 kV (Quad) D/c line

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SRSCT has agreed to shift the 125 MVAR and 80 MVAR line reactors at Nellore (PG) on Nellore PS-Nellore(PG) 400 kV D/c line with suitable arrangement on Nellore(PG) – Sriperumbudur 400 kV D/c line (189 km) and bypass Nellore PS – Nellore 400 kV D/c (quad) line and Nellore – Thiruvalem 400 kV D/c (quad) line at Nellore (PG) for making Nellore PS – Thiruvalem 400kV D/c (quad) line.

Sl no	Scope of the Transmission Scheme	Capacity /ckm	Estimated Cost (Rs. Cr.)
1	a) Shifting of 125 MVAR and 80 MVAR line reactors at Nellore (PG) on Nellore PS-Nellore(PG) 400kV D/c line with suitable arrangement on Nellore(PG) – Sriperumbudur 400kV D/c line. b) Bypassing Nellore PS – Nellore 400 kV D/c (quad) line and Nellore – Thiruvalem 400kV D/c (quad) line at Nellore (PG) for making Nellore PS – Thiruvalem 400kV D/c (quad) line		10-12

The scheme to address the high loading on 400kV Nellore PS – Nellore PG line and high short circuit level at Nellore PG has already been agreed in the 42<sup>nd</sup> Standing Committee on Power System Planning in Southern Region held on 27/04/2018. The following scope of works has already been recommended to be implemented through RTM by POWERGRID in the 2<sup>nd</sup> NCT meeting held on 04.12.2018.

Sl. No.	Scope of the Transmission Scheme	Estimated Cost (Rs.) Cr.
1	Bypassing of Nellore PS – Nellore PG 400kV D/c (Quad) line & Nellore PG – Thiruvalem 400kV D/c (quad) line at Nellore PG to form Nellore PS – Thiruvalem 400kV D/c (Quad) direct line	1.00
2	Conversion of 2x50 MVAR fixed line reactors at Nellore PG on Nellore PG – Thiruvalem 400kV D/c (Quad) line as bus reactor at Nellore PG 400kV sub-station	

## 8. New Inter-State Transmission Schemes in North Eastern Region

### 8.1. Name of the scheme: North Eastern Region Strengthening Scheme-X (NERSS-X)

The scheme was agreed in the 1st meeting of NERSCT held on 29th Nov 2018 at Guwahati as an ISTS scheme.

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Cost
1	Roing (POWERGRID) – Chapakhowa (Assam) 132kV D/c line	40 kms	24
2	132kV line bays at Roing (POWERGRID) S/s	132 line bays - 2	6

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3	132kV line bays at Chapakhowa (Assam)	132 kV line bays - 2	6
		<b>Total</b>	<b>36</b>