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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.

Subject: 5th meeting of "National Committee on Transmission" (NCT) to be held on 21st August 2019 – Agenda

Sir/Madam,

The agenda for the 5th meeting of National Committee on Transmission(NCT) scheduled to be held on 21.08.2019 at 15:30 hrs under the chairmanship of Shri P.S.Mhaske, Chairperson, CEA in conference room of CEA (Manthan), 2nd Floor, Sewa Bhawan, R.K.Puram, New Delhi is available on CEA website: www.cea.nic.in (path to access – Home Page – Wing - Power System-PSPA-I-National Committee on Transmission).

Yours faithfully,

(Signature)
14/8/2019
(Director PSPA-I)

(Goutam Roy)

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

Copy to:

- (i) Joint Secretary (Trans), Ministry of Power, Shram Shakti Bhawan, New Delhi-110001

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- (ii) Chief Engineer (PSPA-II), CEA
- (iii) CEO, RECTPCL, ECE House, 3rd 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 5th meeting of National Committee on Transmission (NCT)**Date and Time: 21.08.2019, 15:30 hrs****Venue: Conference Room of CEA (Manthan), 2nd Floor, Sewa Bhawan, R.K. Puram, New Delhi****1. Confirmation of the minutes of 4th meeting of National Committee on Transmission (NCT)**

a) The minutes of 4th meeting of National Committee on Transmission held on 31.07.2019 were issued vide CEA letter No. CEA-PS-11-15(11)/1/2018-PSPA1 dated 09.08.2019.

b) The minutes of the meeting may be confirmed.

1. Modifications in the transmission schemes already recommended by NCT and ECT

The following modifications in the scheme have been agreed:

1.1 Transmission Schemes recommended for implementation through TBCB:

Fatehgarh-II –Bhadla-II 765 kV D/c line was agreed as a part the transmission system associated with 8.9 GW RE projects in Rajasthan in the 2nd NRSCT meeting held on 13.11.2018. The provision of 240 MVAR switchable line reactor in each circuit at Fatehgarh II end of Fatehgarh II –Bhadla II 765 kV D/c line was agreed on the 4th NRSCT meeting held on 25.07.2019 in view of the increased length of the line (based on survey report of BPC).

S.No	Name of the scheme	Scope agreed in the 3 rd NRSCT	Modified scope agreed in the 4 th NRSCT
1.	Transmission system associated with LTA applications from Rajasthan SEZ Part-B	<p>1. Fatehgarh-II – Bhadla -II 765kV D/c line</p> <p>2. 2 no of 765kV bays at both Fatehgarh-II & Bhadla -II for Fatehgarh-II –Bhadla-II 765kV D/c line</p>	<p>1.Fatehgarh-II – Bhadla -II 765kV D/c line alongwith 1x240 MVAR switchable line reactor in each ckt at Fatehgarh-II end.</p> <p>2. 2 no of 765kV bays at both Fatehgarh-II & Bhadla -II for Fatehgarh-II –Bhadla-II 765kV D/c line</p>

1.1 Transmission Schemes recommended for implementation through RTM

LILLO of Fatehgarh –Bhadla 765 kV D/c line (operated at 400 kV) at Fatehgarh II substation was agreed as a part the transmission system associated with 8.9 GW RE projects in Rajasthan in the 2nd NRSCT meeting held on 13.11.2018. The provision of

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240 MVAR switchable line reactor in each circuit at Fatehgarh II end of Fatehgarh-II – Bhadla 765 kV D/c line (formed after LILO of Fatehgarh-Bhadla 765 kV line to be operated at 400 kV level at Fatehgarh-II) was agreed in the 4th NRSCT meeting held on 25.07.2019 in view of the increased length of the line.

S.No	Name of the scheme	Scope agreed in the 3 rd NRSCT	Modified scope agreed in the 4 th NRSCT
1.	Transmission system associated with LTA applications from Rajasthan SEZ Part-A(RTM)	<p>(i) LILO of Fatehgarh (TBCB) – Bhadla (PG) D/c (765kV line op. at 400kV) line at Fatehgarh-2 so as to establish Fatehgarh (TBCB) – Fatehgarh -II 400kV D/c line (765kV line op. at 400kV) and Fatehgarh -II- Bhadla 400kV D/c line (765kV line op. at 400kV)*</p> <p>(ii) Charging of Fatehgarh-II – Bhadla section at 765kV level</p> <p>(iii) 2 no of 765kV bays at Bhadla for charging of Fatehgarh-II –Bhadla section at 765kV level</p>	<p>(i) LILO of Fatehgarh (TBCB) – Bhadla (PG) D/c (765kV line op. at 400kV) line at Fatehgarh-2 so as to establish Fatehgarh (TBCB) – Fatehgarh -II 400kV D/c line (765kV line op. at 400kV) and Fatehgarh -II- Bhadla 400kV D/c line (765kV line op. at 400kV)*</p> <p>(ii) Charging of Fatehgarh-II – Bhadla section at 765kV level 1X240 MVAR switchable line reactor in each circuit at Fatehgarh-II end of the Fatehgarh-II- Bhadla 765 kV D/C line</p> <p>(iii) 2 no of 765kV bays at Bhadla for charging of Fatehgarh-II –Bhadla section at 765kV level</p>

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

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

Members may like to note.

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

Sl. No.	Independent Transmission Projects	Estimated Cost of the Project as per Empowered Committee (in Rs. Crore)	Estimated Cost of the Project as per Cost Committee (including RoW compensation) (in Rs. Crore)
1.	Construction of Ajmer(PG)-Phagi 765 kV D/c line along with associated bays for Rajasthan SEZ	583	872.06
2.	Transmission system associated with LTA applications from Rajasthan SEZ-Part B	676	1186.25

4. **New Inter-State Transmission Schemes in Northern Region:**

5.1 **Transmission schemes for Solar Energy Zones (SEZs) in Rajasthan (8.1 GW) under Phase-II**

In the 4th meeting of NRST held on 25.07.2019, the following transmission system for evacuation of power from **8.1 GW** potential RE generation, under Phase-II, in Northern Region (**Ramgarh/Kuchheri-1.9 GW, Bikaner-2.95 GW, Bhadla- 1.05GW & Fatehgarh-2.2GW**) was technically agreed:

Transmission schemes for Solar Energy Zones (SEZs) in Rajasthan (8.1 GW) under Phase-II

A. EHVAC Portion

- i) Establishment of 400/220kV, 4x500 MVA pooling station at suitable location near Ramgarh/Kuchheri in Distt Jaisalmer (Ramgarh-II PS)
- ii) Establishment of 400/220kV, 6x500MVA pooling station at suitable location near Bikaner (Bikaner-II PS) with suitable bus sectionalisation at 400 and 220 kV level.
- iii) Establishment of 765/400kV, 3x1500MVA substation at suitable location in Narela (near delhi)
- iv) Augmentation with 765/400kV, 2x1500MVA transformer (5th & 6th) at Fatehgarh-II PS.
- v) Augmentation with 400/220kV, 4x500MVA transformer at Fatehgarh-II PS with suitable bus sectionalisation at 400 and 220 kV level
- vi) Augmentation with 400/220kV, 3x500MVA transformer at Bhadla-II PS with suitable bus sectionalisation at 400 and 220 kV level.
- vii) Augmentation with 765/400kV, 1x1500MVA (3rd)transformer at Bikaner(PG)
- viii) Ramgarh-II PS –Fatehgarh-II PS 400 kV D/c Line (Twin HTLS^s)
- ix) Ramgarh-II PS – Jaisalmer-II (RVPN) 400 kV D/c Line (Twin HTLS^s)

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- x) Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2nd)
- xi) Bikaner-II PS – Khetri 400kV 2xD/c line (*Twin HTLS^s line on M/c tower*)
- xii) Khetri - Bhiwadi 400kV D/c line (*Twin HTLS^s***)
- xiii) Removal of LILO of one circuit of Bhadla-Bikaner(RVFN) 400kV D/c(Quad) line at Bikaner(PG). Extension of above LILO section from Bikaner(PG) upto Bikaner-II PS to form Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line
- xiv) Khetri - Narela 765kV D/c line
- xv) LILO of 765kV Meerut – Bhiwani S/c line at Narela S/s
- xvi) Removal of LILO of Bawana – Mandola 400kV D/c(Quad) line at Maharani Bagh/Gopalpur S/s. Extension of above LILO section from Maharani Bagh/Gopalpur upto Narela S/s so as to form Maharani Bagh – Narela 400kV D/c(Quad) and Maharani Bagh -Gopalpur-Narela 400kV D/c(Quad) lines.
- xvii) LILO of both circuits of Bawana – Mandola 400kV D/c(Quad) line at Narela S/s
- xviii) Power reversal on ± 500 kV, 2500MW Balia – Bhiwadi HVDC line upto 2000MW from Bhiwadi to Balia
- xix) 220kV line bays for interconnection of solar projects at Bikaner-II PS (10 nos.), Ramgarh-II PS (7 nos), Fatehgarh-II PS (8 nos) & Bhadla-II PS (4 nos)
- xx) 1x125 MVA (420kV), 2x240 MVA (765kV) Bus Reactor at Narela Substation
- xxi) 2x125 MVA (420kV) Bus Reactor each at Bikaner-II & Ramgarh-II PS
- xxii) 1x240 MVA Switchable line reactor for each circuit at each end of Fatehgarh-II – Bhadla-II 765kV D/c line (2nd)
- xxiii) 1x80 MVA Switchable line reactor for each circuit at each end of Bikaner-II – Khetri 400kV 2xD/c line
- xxiv) 1x240 MVA Switchable line reactor for each circuit at each end of Khetri – Narela 765kV D/c line

*** Due to space constraints 400kV bays at Bhiwadi S/s to be implemented as GIS*

^s with minimum capacity of 2200 MVA on each circuit at nominal voltage

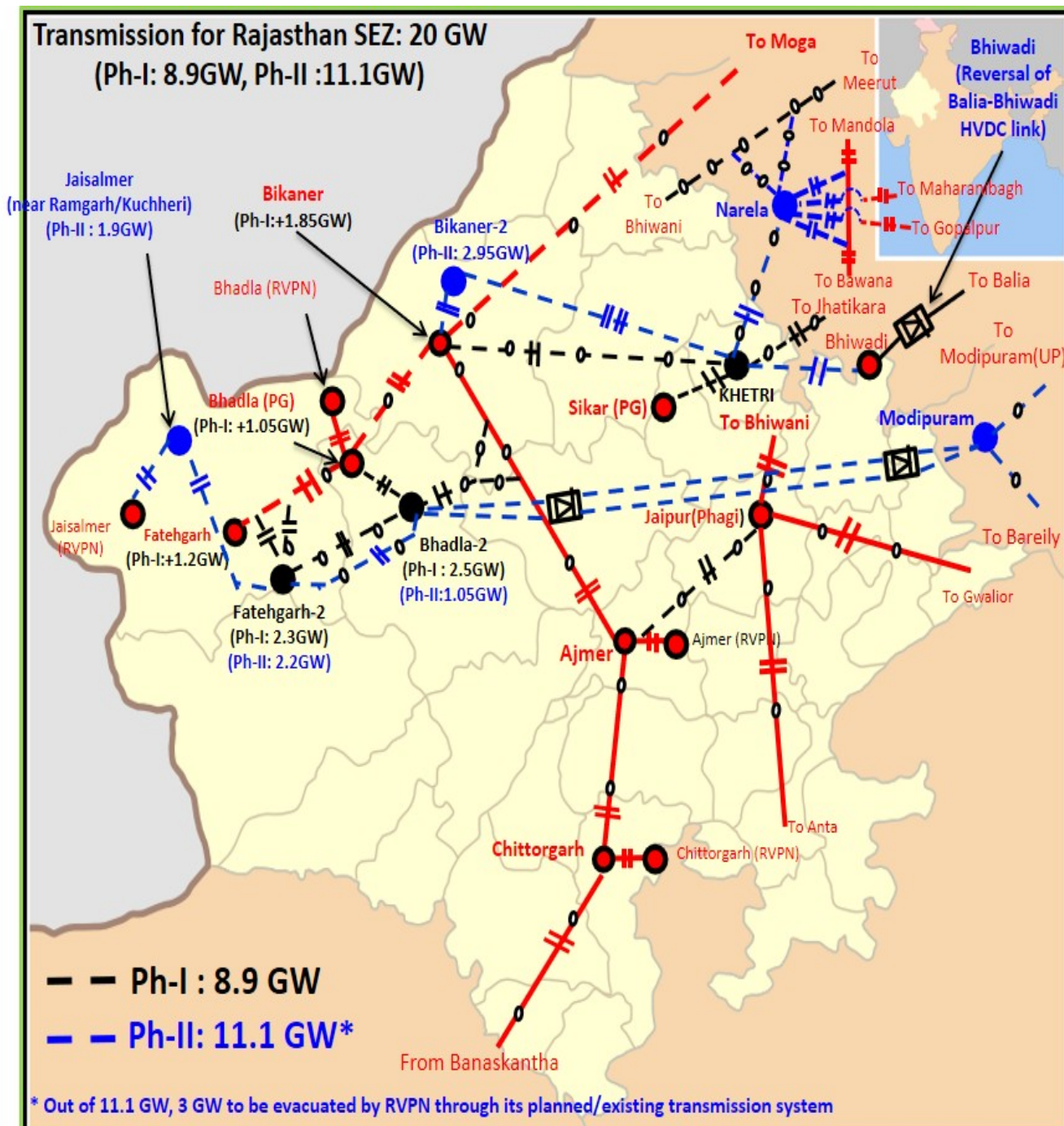
B. HVDC Portion

- 1) VSC based HVDC system between Bhadla-II PS and suitable location near Modipuram
 - i) ± 400 kV, 5000 MW HVDC terminal at Pooling point near Bhadla-II PS
 - ii) ± 400 kV, 5000 MW HVDC terminal at Pooling point in suitable location near Modipuram
 - iii) ± 400 kV HVDC line (Quad) between Bhadla-II PS and suitable location near Modipuram (on M/c tower)

AC interconnection at Pooling point in suitable location near Modipuram

- 2) 5x1500MVA transformer at suitable location (near modipuram)
- 3) Modipuram - Bareilly (PG) 765kV D/c line
- 4) Modipuram - Modipuram (UPPCL) 765kV D/c line
- 5) 2x240 MVA (765kV) Bus Reactor at Modipuram Substation
- 6) 1x240 MVA Switchable line reactor for each circuit at each end of Modipuram - Bareilly (PG) 765kV D/c line

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For implementation purpose, the scheme has been split into following transmission packages:

5.1.1 Name of the Scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part A

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 400/220 kV, 4x500 MVA SEZ Pooling Point at Ramgarh – II PS with 420kV (2x125 MVAR) bus reactor	400/220 kV, 500 MVA ICT – 4 400 kV ICT bays – 4 220 kV ICT bays – 4 400kV line bays - 4	225

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	<u>Future provisions:</u> Space for 400/220 kV ICTs along with bays: 2 400 kV line bays: 2 220 kV line bays:4 420 kV reactors along with bays: 1	220 kV line bays – 7 125 MVAr, 420 kV bus reactor-2 420 kV reactor bay – 2	
2.	Ramgarh-II SEZ PP – Fatehgarh- II 400kV D/c line (Twin HTLS)	Length – 150	255
3.	2 no. of 400 kV line bays at Fatehgarh- II for Ramgarh – II SEZ PP - Fatehgarh 400kV D/c line	400 kV line bays – 2	18
4.	Ramgarh –II – Jaisalmer-II 400 kV D/c line (Twin HTLS)	Length- 60	102
5.	2 no. of 400 kV line bays at Jaisalmer- II for Ramgarh – II SEZ PP - Jaisalmer-II 400kV D/c line	400 kV line bays – 2	18
		Total	618

Note:

- i) Powergrid to provide space for 2 no of 400 kV bays at Fatehgarh II
- ii) M/s RVPNL to provide space for 2 no of 400 kV bays at Jaisalmer II
- iii) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

5.1.2 Name of scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part A (765/400kV ICT augmentation at Fatehgarh II)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Augmentation with 765/400kV, 2x1500MVA transformer (5 th) at Fatehgarh-II PS.	765/400 kV, 1500 MVA ICT – 1 765 kV ICT bays – 1 400 kV ICT bays – 1	72
		Total	72

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5.1.3 Name of the Scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part B

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2 nd)	Length-200	937
2.	2 no. of 765 kV line bays each at Fatehgarh-II and Bhadla-II for Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2 nd)	765 kV line bays – 4	80
3.	1x240 MVAR Switchable line reactor for each circuit at each end of Fatehgarh-II – Bhadla-II 765kV D/c line (2 nd)	240 MVAR, 765 kV reactor- 4 (2 reactors each at Fatehgarh-II and Bhadla-II) Switching equipments for 765 kV reactor - 4 (2 Switching equipments each at Fatehgarh-II and Bhadla-II) <i>(1x80 MVAR spare reactor each at Fatehgarh-II and Bhadla-II to be used as spare for Fatehgarh-II – Bhadla-II 765kV D/c line (2nd))</i>	99
		Total	1116

Note:

- i) *Powergrid to provide space for 2 no of 765 kV bays each at Fatehgarh II and Bhadla II substation and space for 2 no of line reactors each at Fatehgarh II and Bhadla II substation*
- ii) *The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey*

5.1.4 Name of scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part B (765/400/220 ICT augmentation at Fatehgarh II and Bhadla-II)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
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1.	Augmentation with 765/400kV, 2x1500MVA transformer (6 th) at Fatehgarh-II PS.	765/400 kV, 1500 MVA ICT – 1 765 kV ICT bays – 1 400 kV ICT bays – 1	72
2.	Augmentation with 400/220kV, 4x500MVA transformer at Fatehgarh-II PS with suitable bus sectionalisation at 400 and 220 kV level	400/220 kV, 500 MVA ICT – 4 400 kV ICT bays – 4 220 kV ICT bays – 4	138
3.	Augmentation with 400/220kV, 3x500MVA transformer at Bhadla-II PS with suitable bus sectionalisation at 400 and 220 kV level.	400/220 kV, 500 MVA ICT – 3 400 kV ICT bays – 3 220 kV ICT bays – 3	100
		Total	300

5.1.5 Name of the Scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part C (HVDC Package)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	±400kV, 5000 MW HVDC terminal at Pooling point near Bhadla-II PS	5000 MW	6500
2.	±400kV, 5000 MW HVDC terminal at Pooling point in Modipuram (ISTS)	5000 MW	
3.	±400kV HVDC line (Quad) between Bhadla-II PS and Modipuram (ISTS) (on M/c tower)	Length- 700 (@4.5 crore/km)	3150
4.	5x1500MVA 765/400 kV ICT at Modipuram (ISTS) with 2x240 MVA _r (765kV) Bus Reactor <u>Future provisions:</u> Space for 765 kV line bays: 6 765 kV reactor bay: 2	765/400 kV, 1500 MVA ICT – 5 765/400 kV, 500 MVA spare ICT (1-phase) – 1 765 kV ICT bays – 5 400 kV ICT bays – 5 240 MVA _r , 765 kV reactor- 2 765 kV reactor bay – 2	455

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		1x80 MVAR, 765 kV, 1 ph Reactor (spare unit) -1 (for both 1x 80 MVAR bus reactor and 1x80 MVAR line reactor on Modipuram(ISTS) - Bareilly (PG) 765kV D/c line)	
		Total	10105

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

5.1.6 Name of the Scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part C (HVAC package)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Modipuram ISTS - Bareilly (PG) 765kV D/c line	Length- 200	937
2.	2 nos. of 765 kV line bays at Modipuram ISTS and 2 nos. of 765 kV line bays at Bareilly (PG) for Modipuram - Bareilly (PG) 765kV D/c line	765 kV line bays – 4	80
3.	765 kV, 240 MVAR switchable line reactor on each circuit at both ends of Modipuram (ISTS) - Bareilly (PG) 765kV D/c line	240 MVAR, 765 kV reactor- 4 (2 reactors each at Modipuram (ISTS) and Bareilly) Switching equipments for 765 kV reactor - 4 (2 Switching equipments each at Modipuram and Bareilly) (1x80 MVAR spare reactor at Bareilly to be used as spare for Modipuram (ISTS)- Bareilly (PG) 765kV D/c line)	99
4.	Modipuram (ISTS) - Modipuram (UPPCL) 765kV D/c line	Length- 50	234
5.	2 nos. of 765 kV line bays at Modipuram (ISTS) and 2 nos. of 765 kV line bays at Modipuram (UPPCL) for Modipuram (ISTS) - Modipuram (UPPCL) 765kV D/c line	765 kV line bays – 4	80
	Total (in Rs Cr)		1430

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Note:

- i) Powergrid to provide space for 2 no of 765 kV bays at Bareilly substation along with the space for 2 no of line reactors
- ii) Developer of Modipuram (ISTS) to provide space for 4 no of 765 kV line bays at Modipuram (ISTS) substation along with the space for 2 no of line reactors
- iii) UPPTCL to provide space for 2 no of 765 kV bays at Modipuram(UPPTCL) substation along with the space for 2 no of line reactors.
- iv) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

5.1.7 Name of Scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part D

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 765/400 kV, 3X1500 MVA substation at Narela with 765 kV (2x240) bus reactor and 400kV (1x125 MVAR) bus reactor <u>Future provisions:</u> Space for 765/400kV ICTs along with bays: 1 765 kV line bays: 2 400 kV line bays: 6+4 765kV reactor along with bays: 2 400/220 kV ICTs along with bays: 4 220 kV line bays: 8 400 kV reactor along with bays:2	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 – 4 400 kV line bays – 4 240 MVA _r , 765 kV reactor- 2 765 kV reactor bay – 2 125 MVA _r , 420 kV reactor - 1 420 kV reactor bay – 1 80 MVA _r , 765 kV, 1 ph Reactor (spare unit) -1 (for both 1x 80 MVA _r bus reactor and 1x80 MVA _r line reactor on Khetri – Narela 765 kV D/c line)	446
2.	Khetri – Narela 765 kV D/c line	Length -180	843
3.	2 nos. of 765 kV line bays at Khetri for Khetri – Narela 765 kV D/c line	765 kV line bays - 2	40
4.	1x240 MVA _r Switchable line reactor for each circuit at each end of Khetri – Narela 765kV D/c line	240 MVA _r , 765 kV reactor- 4 (2 reactors each at Khetri and Narela) Switching equipments for 765 kV reactor - 4 (2 Switching equipments each at Khetri and Narela) (1x80 MVA _r spare reactor at Khetri to be used as spare for Khetri – Narela 765 kV D/c line)	99

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5.	LILO of 765 kV Meerut-Bhiwani S/c line at Narela	Length – 25	117
6.	LILO of both circuits of Bawana – Mandola 400kV D/c(Quad) line at Narela S/s	Length- 12	31
	Total(in Rs Cr)		1576

Note:

i) Developer of Khetri substation to provide space for 2 no of 765 kV bays at Khetri substation along with the space for 2 no of line reactors

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

5.1.8 Name of Scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part D (Maharani Bagh/Gopalpur-Narela 765/400 kV substation 400 kV interconnection)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Removal of LILO of Bawana – Mandola 400kV D/c(Quad) line at Maharani Bagh/Gopalpur S/s. Extension of above LILO section from Maharani Bagh/Gopalpur upto Narela S/s so as to form Maharani Bagh – Narela 400kV D/c(Quad) and Maharani Bagh -Gopalpur-Narela 400kV D/c(Quad) lines.	Length – 14 (2x7)	36
2.	2 no of line bays at Narela each for Maharani Bagh – Narela 400kV D/c(Quad) and Maharani Bagh -Gopalpur-Narela 400kV D/c(Quad) lines formed after removal of LILO of Bawana – Mandola 400kV D/c(Quad) line at Maharani Bagh/Gopalpur S/s and Extension of above LILO section from Maharani Bagh/Gopalpur upto Narela S/s.	400 kV line bays – 4	36
		Total	72

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Note:

- i) *Developer of Narela substation to provide space for 4 no of 400 kV bays*
- ii) *The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey*

5.1.9 Name of Scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part E

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 400/220 kV, 6x500 MVA SEZ Pooling Point at Bikaner –II PS with suitable bus sectionalisation at 400 kV and 220 kV level and with 420kV (2x125 MVAR) bus reactor <u>Future provisions:</u> Space for 400/220 kV ICTs along with bays: 2 400 kV line bays: 2 220 kV line bays: 4 420 kV reactors along with bays: 1	400/220 kV, 500 MVA ICT – 6 400 kV ICT bays – 6 220 kV ICT bays – 6 400kV line bays - 4 220 kV line bays – 10 125 MVAr, 420 kV bus reactor-2 420 kV reactor bay – 2	300
2.	Bikaner-II SEZ PP – Khetri 400 kV 2xD/c line (Twin HTLS)	Length – 540 (2x270)	917
3.	1x80MVAr switchable Line reactor on each circuit at both ends of Bikaner-II – Khetri 400 kV 2x D/c Line	400 kV 80MVAr reactor – 8 nos. (4 each at Bikaner-II and Khetri) Switching equipments for 400 kV switchable line reactor – 8 (4 each at Bikaner-II and Khetri)	78
4.	4 no. of 400 kV line bays at Khetri for Bikaner –II SEZ PP – Khetri 400kV 2xD/c line	400 kV line bays – 4	36
5.	Khetri- Bhiwadi 400 kV D/c line (Twin HTLS)	Length- 120	204
6.	2 no. of 400 kV line bays at Khetri for Khetri - Bhiwadi 400kV D/c line	400 kV line bays – 2	18

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7.	2 no of 400 kV line bays at Bhiwadi for Khetri- Bhiwadi 400 kV D/c line	400 kV line bays – 2	18
		Total	1571

Note:

- i) Powergrid to provide space for 2 no of 400 kV bays at Bhiwadi substation.
- ii) Developer of Khetri substation to provide space for 6 no of 400 kV bays at Khetri
- iii) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

5.1.10 Name of scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II-Part E (765/400 kV ICT augmentation at Bikaner (PG))

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1	Augmentation with 765/400kV, 1x1500MVA (3 rd) transformer at Bikaner(PG)	765/400 kV, 1500 MVA ICT – 1 765 kV ICT bays – 1 400 kV ICT bays – 1	72
		Total	72

5.1.11 Name of scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II-Part E (Bikaner (PG) and Bikaner II 400 kV interconnection)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Removal of LILO of one circuit of Bhadla-Bikaner (RVPN) 400kV D/c(Quad) line at Bikaner(PG). Extension of above LILO section from Bikaner(PG) up to Bikaner-II PS to form Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line	Length - 25	65
2.	2 nos. of 400 kV line bays at Bikaner-II PS for Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line formed after removal of LILO of one circuit of Bhadla-Bikaner(RVPN) 400kV D/c(Quad)	400 kV line bays – 2	18

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	line at Bikaner(PG) and extension of above LILO section from Bikaner(PG) up to Bikaner-II PS		
		Total	83

Note:

- i) Developer of Bikaner II to provide space for 2 no of 400 kV bays
- ii) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

5.1.12 Name of scheme: Transmission Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II (Power reversal on Balia – Bhiwadi HVDC line)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Power reversal on ± 500 kV, 2500MW Balia – Bhiwadi HVDC line upto 2000MW from Bhiwadi to Balia	2000 MW	
		Total	

5.2 Name of the Scheme: Supplementary scheme associated with Bikaner-Moga 765 kV D/c line under Green Energy Corridor

The scheme was agreed in the 4th meeting of NRSCT held on 25.07.2019. The details scope of the scheme is as under:

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	<p>400kV Bus splitting at Moga</p> <p><u>400kV Bus Section-1</u></p> <ul style="list-style-type: none"> • 400kV Kishenpur D/c feeders • 400kV Hisar D/c feeders • 2 nos. 765/400kV transformers • 1 No. 50 MVAR <p><u>400kV Bus Section-2</u></p> <ul style="list-style-type: none"> • 400kV Jalandhar D/c feeders • 400kV Bhiwani feeder 		45

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	<ul style="list-style-type: none"> • 400kV Fatehabad feeder • 400kV Nakodar feeder • 400kV Talwandi Sabo/Malkana Feeder • 4 nos. 400/220kV transformers • 1 No. 125 MVAR 		
		Total	45

5.3 Name of the Scheme: Construction of 2 nos. of 400 kV bays under ISTS at 765/400 kV PGCIL substation, Varanasi:

The scheme was agreed in the 4th meeting of NRSCT held on 25.07.2019 for termination Jaunpur- Varanasi 400 kV D/C line of UPPTCL. UPPTCL has requested for implementation of the bays by January 2021. The details scope of the scheme is as under:

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	2 nos. of 400 kV bays (GIS) at 765/400 kV Varanasi (PGCIL) substation for Jaunpur-Varanasi (PGCIL) 400 kV D/c line	400 kV line bays – 2 (GIS)	26
		Total	26

5.4 Name of the Scheme: Additional 1x500 MVA, 400/220kV (4th) transformer at Balachak under ISTS.

The scheme was agreed in the 4th meeting of NRSCT held on 25.07.2019 for n-1 compliance at Balachak 400/220 kV substation. PSTCL has requested for implementation of the scheme in compressed time schedule by June 2020. The details scope of the scheme is as under:

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Additional 1x500 MVA, 400/220kV (4th) transformer at Balachak	400/220 kV, 500 MVA ICT – 1 400 kV ICT bays – 1	36

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		220 kV ICT bays – 1	
		Total	36

5.5 Name of the Scheme: 220 kV Two Feeder bays at Saharanpur (400) PGCIL:

The scheme was agreed in the 3rd meeting of NRSCT held on 24.5.2019. The details scope of the scheme is as under:

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	220 kV Two Feeder bays at Saharanpur (400) PGCIL for Saharanpur (400) PGCIL-Deoband (Saharanpur) 220 kV D/C line	220 kV line bays – 2	8
		Total	8