

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 269/MP/2019

Coram:

Shri P.K. Pujari, Chairperson

Shri I.S Jha, Member

Date of Order: 12.5.2020

In the matter of:

Section 38(2) of the of the Electricity Act, 2003 read with Section 79(1)(c) and Section 79(1)(k) of the Act, along with (i) Central Electricity Regulatory Commission (Grant of Regulatory Approval for execution of Inter-State Transmission Scheme to Central Transmission Utility) Regulations, 2010; (ii) Regulation 111 & 114 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and (iii) Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 for Grant of Regulatory Approval for execution of the Transmission Scheme for Solar Energy Zones (SEZs) in Rajasthan under Phase-II.

And in the matter of:

Power Grid Corporation of India Limited
B-9, Qutab Institutional Area,
Katwaria Sarai, New Delhi

Corporate office:

“Saudamini”, Plot No: 2,
Sector-29, Gurgaon (Haryana) - 122 001

.....Petitioner

Vs

1. Delhi Transco Ltd
Shakti Sadan, Kotla Road,
New Delhi-110 002
Represented by its Chairman
2. BSES Yamuna Power Ltd,
BSES Bhawan, Nehru Place, New Delhi.
Represented by its CEO
3. BSES Rajdhani Power Ltd,
BSES Bhawan, Nehru Place,
New Delhi
Represented by its CEO



4. Tata Power Delhi Distribution Limited,
Power Trading & Load Dispatch Group
Cennet Building, Adjacent To 66/11kV Pitampura-3
Grid Building, Near PP Jewellers
Pitampura, New Delhi – 110034
Represented by its Managing Director
5. Rajasthan Rajya Vidyut Prasaran Nigam Limited
Vidyut Bhawan,
Vidyut Marg, Jaipur - 302 005
Represented by its Chairman
6. Ajmer Vidyut Vitran Nigam Ltd
Vidyut Bhawan, Panchsheel Nagar,
Makarwali Road, Ajmer 305 004
Represented by its Managing Director
7. Jaipur Vidyut Vitran Nigam Ltd
Vidhyut Bhawan, Janpath
Jaipur – 302005, Rajasthan
Represented by its Chairman
8. Jodhpur Vidyut Vitran Nigam Ltd
New Power house, Industrial area
Jodhpur- 342003, Rajasthan.
Represented by its Managing Director
9. Himachal Pradesh State Electricity Board
Vidyut Bhawan
Kumar House Complex Building II
Shimla-171 004
Represented by its Chairman
10. Punjab State Transmission Corporation Ltd.
The Mall, Patiala 147 001
Represented by its Chairman and Managing Director
11. Haryana Vidyut Prasaran Nigam Ltd.
Shakti Bhawan, Sector No-6, Panchkula-134109
Represented by its Chairman
12. Power Development Deptt.
Govt. Of Jammu & Kashmir
Mini Secretariat, Jammu
Represented by its Commissioner



13. Uttar Pradesh Power Corporation Ltd.
(Formerly Uttar Pradesh State Electricity Board)
Shakti Bhawan, 14, Ashok Marg
Lucknow - 226 001
Represented by its Chairman
14. Chandigarh Electricity Department
4th Floor, U.T. Secretariat, Sector 9,
Chandigarh – 160017
Represented by its Principal Secretary
15. Uttarakhand Power Corporation Ltd.
Urja Bhawan
Kanwali Road, Dehradun.
Represented by its Managing Director
16. North Central Railway
Allahabad.
Represented by its Chief Electrical Distribution Engineer
17. New Delhi Municipal Council
Palika Kendra, Sansad Marg,
New Delhi-110002
Represented by its Chairman
18. Solar Energy Corporation of India Limited
D-3, A Wing, 1st Floor, Religare Building,
District Centre, Saket,
New Delhi – 110017
Represented by its Chairman

.....Respondents

Parties Present: Shri Mukesh Khanna, PGCIL
Ms. Jyoti Prasad, PGCIL
Shri Yatin Sharma, PGCIL
Shri Siddharth Sharma, PGCIL

ORDER

The present Petition has been filed by the Petitioner, Power Grid Corporation of India Limited (PGCIL) under Section 38(2) of the Electricity Act, 2003 (hereinafter referred



to as the “2003 Act”) read with Section 79(1)(c) and 79(1)(k) of the said Act for grant of Regulatory approval for execution of the transmission system for Solar Energy Zones in Rajasthan. The Petitioner has made the following prayers:

- “(a) Grant Regulatory approval for taking up implementation of identified transmission system;*
- (b) Grant of approval for recovery of transmission charges of the assets through CERC (Sharing of Transmission charges and losses for ISTS) Regulations, 2010 and its amendment(s) notified by CERC from time to time; and*
- (c) Grant of approval for inclusion of the above system under the TSA notified by CERC.”*

Submissions of the Petitioner

2. The Petitioner has submitted the following:

- a) The Government of India has set a target for establishing 175 GW renewable capacity by 2022 which includes 100 GW solar and 60 GW wind generation capacity. MNRE (Ministry of New and Renewable Energy, Government of India) vide its order dated 08.06.2018 had constituted a sub-committee to identify ISTS connectivity for renewable energy (RE) projects from potential Solar Energy Zones (SEZs) and potential Wind Energy Zones (WEZs) of about 50 GW and 16.5 GW respectively. SEZs and WEZs envisaged in 7 RE rich states (Tamil Nadu, Andhra Pradesh, Karnataka, Gujarat, Rajasthan, Maharashtra and Madhya Pradesh) were identified by SECI (Solar Energy Corporation of India) in association with MNRE and in consultation with RE power developers. Further, to ease the implementation of transmission system, the sub-committee constituted by MNRE, in its report has proposed for implementation of transmission infrastructure for above envisaged RE generation in two phase viz., 20 GW solar and 9 GW wind projects planned in Phase-I (up to December 2020) and 30 GW solar and 7.5 GW wind projects planned for Phase-II (December 2021).
- b) Accordingly, in respect of 66.5 GW solar and wind generation potential, transmission system has been planned as detailed below:



Sl. No.	Region	RE Capacity (GW)			Remarks
		Phase - I	Phase - II	Total	
1.	Northern Region	8.9	11.1*	20	Phase - I: Commission vide order dated 09.08.2019 in Petition no. 23/MP/2019 has granted Regulatory Approval for 8.9 GW under Phase- I. Phase-II: Covered under instant petition.
2.	Western Region	10.5**	17.5	28	Petition (bearing no. 197/MP/2019) have been filed.
3.	Southern Region	10	8.5	18.5	Petition (bearing no. 200/MP/2019) have been filed.
	Grand Total	29.4	37.1	66.5	-

* Out 11.1 GW, 3 GW being implemented under Intra State by Rajasthan.

** 1 GW being implemented under Intra-state in Osmanabad area in Maharashtra.

c) For Northern Region, it was proposed to implement the transmission system associated with 8.9 GW solar generation in Phase-I (up to December 2020) and 11.1 GW solar generation in Phase-II (upto December 2021). The details regarding the Solar Energy Zones in Northern region is tabulated below:

District	Taluka/ Tehsil	Solar Energy Zones (GW)				
		Phase - 1	Phase - 2			Total
			2020	2021		
				ISTS	Intra-State	
Jaisalmer	Kuchhri/ Ramgarh	-	1.90	2.1	4.0	4.00
	Fatehgarh	3.50	2.20	-	2.2	5.70
Jodhpur	Phalodi/Bhadla	3.55	1.05	0.7	1.75	5.30
Bikaner	Koyalat /Pugal	1.85	2.95	0.2	3.15	5.00
	Total	8.90	8.1	3	11.1	20

d) Out of total 20 GW SEZ in Rajasthan, transmission system for 8.9 GW in Bhadla (3.55 GW), Fatehgarh (3.5 GW) and Bikaner (1.85 GW) complexes under Phase-I has been taken up for implementation. Application for Stage-II connectivity for about 8 GW and LTA applications for about 6 GW against Phase-I transmission system (8.9 GW) have been received.



e) The transmission system for integration of balance 11.1 GW solar potential in Rajasthan under Phase-II {from Ramgarh/ Kuchheri (4 GW), Bikaner (3.15 GW), Bhadla (1.75 GW) and Fatehgarh (2.2 GW)} was deliberated in the 3rd meeting of Northern Region Standing Committee on Transmission (NRSCT) held on 24.05.2019.

f) Further, RE capacity of 3 GW solar located in Jaisalmer (2.1 GW), Jodhpur (0.7 GW) and Bikaner (0.2 GW) is planned by Rajasthan for transfer through intra-State network in timeframe of 2021-22, which is part of 11.1 GW Solar generation envisaged by MNRE in Northern Region.

g) Therefore, after accounting for development of solar generation (3 GW) in intra-State network in similar pockets, transmission system for only 8.1 GW (i.e. 11.1 GW – 3 GW) Ramgarh/ Kuchheri (1.9 GW), Bikaner (2.95 GW), Bhadla (1.05 GW) & Fatehgarh (2.2 GW) of RE potential is required to be planned under ISTS as compared to 11.1 GW that was proposed earlier. It was decided that a joint study meeting would be convened to further deliberate on the scheme.

h) A joint study meeting was convened on 17th & 18th June 2019 at POWERGRID, Gurgaon, wherein, the representatives from CTU, POSOCO, Haryana, Punjab, Himachal Pradesh, Rajasthan and Delhi were present. No representative from UPPTCL, PTCUL and JKPDD attended the meeting. All the State representative furnished their load generation balance as well as existing and planned RE generations in respective States. The comments furnished by the constituents were discussed and accordingly the load flow study was revised. Subsequently, PTCUL representative also updated the network pertaining to them.

i) As advised by the constituents during above joint study meeting, following two alternatives were proposed for transfer of 8.1 GW under ISTS as part of Phase-II:

- (i) AC Transmission system
- (ii) Hybrid Transmission system involving VSC based HVDC.



j) The transmission scheme was further discussed in the 4th meeting of NRSCT held on 25.07.2019. During the meeting, it was opined that the control of active/ reactive power, line loadings and voltages in 765 and 400kV AC transmission system may pose operational difficulties considering intermittency and variable nature of large quantum of RE generation (both intra-State and ISTS) expected to be available in Western Rajasthan. Further, AC transmission system also generates lots of reactive power during low RE/ light-loaded condition, thus increasing voltages at various substations. After detailed deliberations, it was decided to go ahead with hybrid option of AC and HVDC so as to provide steady state and dynamic reactive power support to the AC transmission system in Rajasthan. Therefore, VSC based HVDC has been considered for transfer of power directly from Bhadla-II to load center near NCR viz. Modipuram as the same can also provide reactive power support just like STATCOM and may take care of the dynamic active/ reactive power support for renewable integration in Rajasthan as well as such support in NCR area. Further, considering the uncertainty of adequate short circuit level due to RE generation capacity as well as facility to install VSC (Voltage Source Converter) based HVDC in a modular manner, the same has been considered in comparison to LCC (Line Commutated Converter) based HVDC.

k) It was also informed that VSC based HVDC is widely used for integration of renewable energy.

l) After deliberation of various options during 4th NRSCT meeting, hybrid transmission system involving VSC based HVDC transmission scheme for Solar Energy Zones (SEZs) in Rajasthan under Phase-II has been technically agreed to cater to the future potential (8100 MW) at the complexes in Ramgarh, Fatehgarh, Bhadla/Phalodi & Bikaner.

m) Considering power transfer from solar potential areas of various complexes in Western Rajasthan i.e. Ramgarh, Fatehgarh, Bhadla/Phalodi and Bikaner, technically agreed transmission system includes establishment of 400/220kV pooling station near Ramgarh/Kuchheri in Distt Jaisalmer (Ramgarh-II PS) and near Bikaner



(Bikaner-II PS). The scheme also includes augmentation of transformation capacity at Fatehgarh-II PS, Bhadla-II PS and Bikaner (PG).

n) For interconnection of new pooling stations with existing/ under construction transmission system and to strengthen existing transmission system, Ramgarh-II PS –Fatehgarh-II PS 400 kV D/c (Twin HTLS), Ramgarh-II PS – Jaisalmer-II (RVPN) 400 kV D/c (Twin HTLS), Fatehgarh-II PS – Bhadla-II PS 765kV D/c (2nd), Bikaner-II PS – Khetri 400kV 2xD/c (Twin HTLS), Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) have been agreed.

o) For onward dispersal of power, development of high capacity corridors viz. Khetri - Bhiwadi 400kV D/c(Twin HTLS), Khetri - Narela 765kV D/c and \pm 400kV, 5000 MW VSC based HVDC system between Bhadla-II PS and suitable location near Modipuram have been planned. For dispersal of power from Modipuram HVDC, Modipuram - Bareilly (PG) 765kV D/c and Modipuram - Modipuram (UPPCL) 765kV D/c have also been agreed.

p) The scheme also envisages establishment of 765/400 kV Narela S/s, LILO of Meerut – Bhiwani 765kV S/c line at Narela S/s, LILO of both circuits of Bawana – Mandola 400kV D/c(Quad) line at Narela S/s, Maharaniabagh – Narela 400kV D/c(Quad) and Gopalpur-Narela 400kV D/c(Quad) lines.

q) For optimal utilization of transmission system, it was agreed to reverse the conventional power flow of Balia – Bhiwadi HVDC, i.e. 2000 MW power from Bhiwadi to Balia.

r) In addition, suitable reactive compensation in the form of bus reactor at above substations as well as switchable line reactors on EHV AC lines were also agreed.

s) Accordingly, following transmission system for transfer of 8.1 GW RE generation (under Phase – II) were technically agreed in the 4th NRSCT meeting:

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^{\$})
- ix) Ramgarh-II PS – Jaisalmer-II (RVPN) 400 kV D/c Line (Twin HTLS^{\$})
- x) Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2nd)
- xi) Bikaner-II PS – Khetri 400kV 2xD/c line (*Twin HTLS^{\$} line on M/c tower*)
- xii) Khetri - Bhiwadi 400kV D/c line (Twin HTLS^{\$})**
- xiii) 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) upto Bikaner-II PS to form Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line
- xiv) Khetri - Narela 765 kV 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_r (420kV), 2x240 MVA_r (765kV) Bus Reactor at Narela Substation
- xxi) 2x125 MVA_r (420kV) Bus Reactor each at Bikaner-II & Ramgarh-II PS
- xxii) 1x240 MVA_r Switchable line reactor for each circuit at each end of Fatehgarh-II – Bhadla-II 765kV D/c line (2nd)
- xxiii) 1x80 MVA_r Switchable line reactor for each circuit at each end of Bikaner-II – Khetri 400kV 2xD/c line
- xxiv) 1x240 MVA_r 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
 § 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) ±400kV, 5000 MW HVDC terminal at Pooling point near Bhadla-II PS
 - ii) ±400kV, 5000 MW HVDC terminal at Pooling point in suitable location near Modipuram
 - iii) ±400kV 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_r (765kV) Bus Reactor at Modipuram Substation
- 6) 1x240 MVA_r Switchable line reactor for each circuit at each end of Modipuram - Bareilly (PG) 765kV D/c line

Note: Suitable space provision to be kept at Ramgarh-II, Bikaner-II PS, Narela & Modipuram S/s for spares & future expansion

- t) The estimated cost of proposed transmission scheme for transfer of 8.1 GW RE generation (under Phase – II) is about Rs. 17025 crore.



u) The timeframe for implementation of envisaged transmission scheme is December 2021 in line with report of the sub-committee constituted by MNRE.

Discussion and approval of Transmission System

v) The transmission scheme for Solar Energy Zones (SEZs) in Rajasthan under Phase-II for transfer of power from Ramgarh/ Bhadla/ Fatehgarh/ Bikaner complexes was discussed with the stakeholders in 3rd meeting of NRSCT held on 24.05.2019. Transmission scheme was further discussed in a joint study meeting convened on 17th & 18th June 2019 at POWERGRID, Gurgaon, wherein, the representatives from CTU, POSOCO, Haryana, Punjab, Himachal Pradesh, Rajasthan and Delhi were present. Subsequently, transmission scheme was discussed during meeting amongst CEA, CTU, POSOCO, RVPNL, HVPNL, DTL, HPPTCL, PTCUL & PSTCL on 24.07.2019 and technically agreed in the 4th meeting of NRSCT held on 25.07.2019.

w) Transmission scheme has been discussed in the 5th National Committee on Transmission (NCT) held on 21.08.2019 (minutes of meeting awaited) and shall be discussed in forthcoming Northern Regional Power Committee (NRPC) and Empowered Committee on Transmission (ECT) meetings.

Status of Consultation with the Stakeholders along with comments/ suggestions of Stakeholders and its treatment

x) The details of the scheme, its justification, estimated cost and its tariff impact, results of the system studies, study assumptions, stakeholder consultation/ approval details etc. were published on the Petitioner's website on 14.08.2019.

y) Results of the system studies carried out with the proposed scheme for various scenarios, assumptions and inputs considered in above system studies has been submitted.

Other Submissions

z) Keeping in view the nature of development of Renewable Energy generation (i.e., gestation period of 12-18 months), the development of transmission system needs to lead the RE generation so that the execution of transmission and generation is in matching time frame.



aa) In line with the direction of the Ministry of Power to the Commission under Section 107 of the Act and based on the facts at above, the Petitioner is applying for regulatory approval under provisions of Regulation 3(1)(i) read with Regulation 8 (Power to Relax) and Regulation 9 (Power to remove difficulties) of CERC (Grant of Regulatory Approval for execution of Inter-State Transmission Scheme to Central Transmission Utility) Regulations, 2010 (hereinafter referred to as the Regulatory Approval Regulations).

bb) A Project Inception Report as required under the CERC (Grant of Regulatory Approval for execution of Inter-State Transmission Scheme to Central Transmission Utility) Regulations, 2010 has been prepared and attached with the Petition.

Submissions during Hearing held on 24.9.2019

3. The Representative of the Petitioner submitted that the transmission scheme under the instant Petition is associated with 11.1 GW (including 3 GW being implemented at intra-State level) RE potential spread across four zones namely, Jaisalmer, Bikaner, Bhadla and Fatehgarh in the State of Rajasthan envisaged to come up by December, 2021.

4. The Representative of the Petitioner further submitted that keeping in view the shorter gestation period of renewable energy generation, the development of transmission system needs to lead tRE generation so that execution of transmission and generation is in matching timeframe. The Representative also submitted that the transmission scheme under instant Petition was initially discussed in the 4th meeting of Northern Regional Standing Committee for Transmission (NRSCT) held on 25.7.2019 and was subsequently discussed in 5th NRSCT meeting held on 13.9.2019. Considering the difficulty in



implementation of the hybrid scheme by December 2021 and high cost of the HVDC system, revised transmission scheme comprising of AC system has been finally agreed.

5. The Representative of the Petitioner submitted that the revised transmission scheme is scheduled to be discussed in the 46th Northern Regional Power Committee (NRPC) that was being held on 24.9.2019. In compliance with the Central Electricity Regulatory Commission (Planning, Coordination and Development of Economic and Efficient Inter-State Transmission System by Central Transmission Utility and other related matters) Regulations, 2018, the revised transmission scheme has also been uploaded for stakeholders comments on the Petitioner's website on 20.9.2019. After hearing the representative of the Petitioner, the Commission admitted the Petition and directed the Petitioner to file the following information:

- i) Minutes of 5th NRSCT meeting held on 13.9.2019;
- ii) Minutes of 46th NRPC held on 24.9.2019;
- iii) Revised Transmission Scheme as agreed;
- iv) Revised Project Inception Report; and
- v) Results of system studies carried out by the Petitioner and comments/suggestions of stakeholders and its treatment.

6. In compliance to direction of the Commission vide ROP for hearing dated 24.9.2019, the Petitioner vide affidavit dated 15.11.2019 has submitted the details as under:

A. Minutes of 5th NRSCT meeting held on 13.9.2019

a) The transmission scheme was initially discussed and agreed by NR constituents in the 3rd & 4th meeting of Northern Regional Standing Committee for Transmission (NRSCT) held on 24.05.2019 and 25.07.2019 respectively wherein hybrid system involving VSC based HVDC transmission schemes was finalized for Solar Energy Zones (SEZs) in Rajasthan (11.1 GW) under Phase-II.

b) Subsequent to filing of the instant Petition, the transmission scheme was further discussed in 5th NRSCT meeting held on 13.09.2019. During the meeting, CEA stated that the detailed cost worked out for proposed transmission schemes



(hybrid system involving VSC based HVDC system) is of the order of Rs. 17,000 crore. It was also observed that the timeframe for implementation of transmission scheme is 2021-22, as most of the generations are likely to be added in the same time frame. Therefore, it would be difficult to implement VSC based HVDC transmission system in the desired timeframe. Considering the high cost and difficulty in implementation of VSC based HVDC transmission system by 2021-22, it was decided to review the transmission system agreed in the 4th NRSCT. Accordingly, load flow studies were carried out and 3 different alternatives as under were worked out with HVAC system alongwith provision of STATCOM to provide dynamic reactive power support for such a huge RE addition:

- Alternative 1 (Modipuram): Transmission System for Transfer of Power from Rajasthan SEZ to Modipuram via Sikar-II – Modipuram 765kV D/c & Sikar-II – Neemrana 400kV D/c(Twin HTLS) with provision of STATCOMs at Fatehgarh-II, Bhadla-II and Sikar-II.
- Alternative 2 (Kadarpur): Transmission System for Transfer of Power from Rajasthan SEZ to Bareilly via Sikar-II – Kadarpur-II – Bareilly 765kV D/c, Sikar-II – Neemrana 400kV D/c(HTLS) and Kadarpur-II – Prithala 400kV D/c(Twin HTLS) with provision of STATCOMs at Fatehgarh-II, Bhadla-II and Sikar-II.
- Alternative 3 (Aligarh): Transmission System for Transfer of Power from Rajasthan SEZ to Aligarh via Sikar-II –Aligarh 765kV D/c & Sikar-II – Neemrana 400kV D/c(Twin HTLS) with provision of STATCOMs at Fatehgarh-II, Bhadla-II and Sikar-II.

c) All the constituents including Rajasthan expressed concern regarding increase in POC charges with the proposed AC transmission system and they suggested that a recommendation/ suggestion must be submitted to Gol from NRSCT so that the approved transmission system may be developed through Viability Gap Funding (VGF) mode or Central Government may provide funding from Central assistance so that its impact through PoC mechanism is reduced on the Discoms.

d) RVPNL also raised the concern about high voltages in the intra-State grid



during no solar scenario. It was deliberated that adequate reactive compensation has been provided under the scheme.

e) PSCTL and RVPNL opined that storage facility in generating plants and installation of battery banks equivalent to 1/3rd capacity of solar power projects may be explored. Towards this, SECI informed that they have already issued a tender regarding development of co-located storage facility.

f) RVPNL and HVPN raised the issue of increase in the fault level in intra-State transmission system due to interconnection with the proposed ISTS transmission system. It was discussed that separate studies would be carried out to reduce the fault level at various nodes.

g) POSOCO enquired about the rationale for providing STATCOMs near generating stations. It was informed that in the absence of conventional generator and low short circuit levels in close proximity during fault conditions, grid/ voltage stability would be a major concern. Due to persistence of low voltage in the network, there could be cascading effect of multiple RE generation tripping due to breach of LVRT triggers. This could lead to further fall in system voltage due to generation loss and may lead to voltage collapse in the system. Considering huge volume of renewable energy (both intra-State and ISTS) expected to be available in Western Rajasthan, high ramp up/ down of generation is envisaged. In such a scenario, manual switching ON/OFF of reactors may not be practically feasible and STATCOMs may be used for switching in/out nearby reactors.

h) Rajasthan requested to explore to split bus arrangement of existing CTU buses so that no solar power exchange occurs with STU system as these solar generators are inter-State generators getting connected at Solar Parks viz. Bhadla Fatehgarh, Ramgarh/ Kuchheri and Bikaner and the Discoms of Rajasthan would have no commercial agreement with these solar generators. It was informed that Bus sectionalisation at Fatehgarh-II, Bhadla-II and Bikaner-II have already been envisaged in the present scheme. Requirement of further splitting of buses shall be studied alongwith separate joint studies.



i) It was discussed that Alternative-1 involves Modipuram (UPPTCL) which is presently under tendering process and accordingly its commissioning by December 2021 is uncertain. Regarding, Alternative-2, HVPNL opined that the option includes additional 765/400kV S/s at Kadarpur, hence costlier than alternative 1 and 3.

j) Time frame for implementation of envisaged transmission scheme is Dec' 21 in line with Minutes of Meeting held at CEA on 30.08.2019.

B. Minutes of 46th meeting of NRPC held on 24.9.2019

a) The revised EHVAC transmission scheme was taken up for discussion in 46th Northern Regional Power Committee (NRPC) on 24.09.2019. The major concerns/ deliberations during the meeting are mentioned below:

- RVPNL stated that the transmission network for intermittent RE generation may create dispatch as well as reactive compensation problems for Rajasthan and also stressed that any state with such huge quantum of RE Generation should not be penalized for unscheduled interchange charges due to nature of such power. Also, such large network will increase the fault level of Rajasthan and effects of such schemes on Rajasthan needs to be highlighted as equipment may be required to be changed due to such high fault levels. Further, possibility of battery storage to avoid ramping up and down may be considered.
- PSTCL stated that if transmission system for Phase-I (8.9 GW) and Phase-II (8.1 GW) are considered together, then cost of transmission charges for such ISTS network may be to the tune of Rs 1.22 per unit. With this, and considering impact of thermal backing, losses, etc. the cost of such RE power would be of the order of Rs 5.98 per unit and such expensive power can't be procured by the States. PSTCL proposed that transmission schemes related to RE Green corridor may be funded by Gol by creating a separate provision and may not be burdened on the constituents.

b) It was deliberated that constituent views have already been discussed in detail in 5th NRSCT held on 13.09.2019 and after noting the concern of constituents, NRPC approved the scheme finalized in 5th NRSCT as per the deliberations held in TCC, along with views of constituents.



C. Revised Transmission Scheme as agreed

a) After deliberations in the 5th NRSCT meeting held on 13.09.2019 considering the techno-economics and the implementation time period, following transmission system strengthening for potential solar energy zones (11.1 GW) – Phase-II in Northern Region (8.1 GW under ISTS and 3.0 GW under intra-State by RVPNL) was agreed:

- I. Establishment of 400/220kV, 4x500 MVA pooling station at suitable location near Ramgarh/Kuchheri in Distt Jaisalmer (Ramgarh-II PS) with 2x125 MVA bus reactor at 400kV level.
- II. Ramgarh-II PS – Fatehgarh-II PS 400 kV D/c Line (Twin HTLS*)
- III. Ramgarh-II PS – Jaisalmer-II (RVPN) 400 kV D/c Line (Twin HTLS*)
- IV. Establishment of 400/220kV, 6x500MVA pooling station at suitable location near Bikaner (Bikaner-II PS) with 2x125 MVA bus reactor at 400kV level and with suitable bus sectionalisation at 400 kV level and 220 kV level.
- V. Bikaner-II PS – Khetri 400kV 2xD/c line (Twin HTLS* line on M/c tower)
- VI. 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) upto Bikaner-II PS to form Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line)
- VII. 1x80 MVA Switchable line reactor for each circuit at each end of Bikaner-II – Khetri 400kV 2xD/c line
- VIII. Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Sikar (Sikar-II Substation) with 1x125 MVA at 400kV level & 2x330 MVA bus reactors at 765kV level at Sikar -II
- IX. Sikar-II – Aligarh 765kV D/c line
- X. Bhadla-II PS – Sikar-II 765kV 2xD/c line
- XI. Sikar-II – Neemrana 400kV D/c line (Twin HTLS*)
- XII. 1x330 MVA Switchable line reactor for each circuit at Sikar-II end of Bhadla-II – Sikar-II 765kV 2xD/c line
- XIII. 1x240 MVA Switchable line reactor for each circuit at Bhadla-II end of Bhadla-II – Sikar-II 765kV 2xD/c line
- XIV. 1x330MVA Switchable line reactor for each circuit at each end of Sikar-II – Aligarh 765kV D/c line
- XV. Augmentation with 765/400kV, 2x1500MVA transformer (5th & 6th) at Fatehgarh-II PS
- XVI. Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2nd)
- XVII. 1x240 MVA Switchable line reactor for each circuit at each end of



- Fatehgarh-II – Bhadla-II 765kV D/c line
- XVIII. Augmentation with 400/220kV, 4x500MVA transformer (6th to 9th) at Fatehgarh-II PS with suitable bus sectionalisation at 400 kV & 220 kV
- XIX. Augmentation with 765/400kV, 1x1500MVA transformer (4th) at Bhadla-II PS.
- XX. Augmentation with 400/220kV, 3x500MVA transformer (6th to 8th) at Bhadla-II PS with suitable bus sectionalisation at 400 kV & 220 kV
- XXI. Khetri - Bhiwadi 400kV D/c line (Twin HTLS*)#
- XXII. Power reversal on \pm 500kV, 2500MW Balia – Bhiwadi HVDC line upto 2000MW from Bhiwadi to Balia in high solar generation scenario
- XXIII. 220kV line bays for interconnection of solar projects at Bikaner-II PS (10 nos.), Ramgarh-II PS (7 nos), Fatehgarh-II PS (7 nos) & Bhadla-II PS (4 nos)
- XXIV. Establishment of 765/400 kV, 3X1500 MVA GIS substation at Narela with 765 kV (2x330 MVAR) bus reactor and 400kV (1x125 MVAR) bus reactor.
- XXV. Khetri – Narela 765 kV D/c line
- XXVI. 1x330 MVAR Switchable line reactor for each circuit at Narela end of Khetri – Narela 765kV D/c line
- XXVII. LILO of 765 kV Meerut- Bhiwani S/c line at Narela
- XXVIII. 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.
- XXIX. STATCOM:
 Fatehgarh – II S/s: STATCOM: \pm 600 MVAR, 4x125 MVAR MSC, 2x125 MVAR MSR
 Bhadla – II S/s: STATCOM: \pm 600 MVAR, 4x125 MVAR MSC, 2x125 MVAR MSR
 Bikaner – II S/s: STATCOM: \pm 300 MVAR, 2x125 MVAR MSC, 1x125 MVAR MSR

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

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

- b) Subsequently, the scheme has been discussed in 6th NCT meeting held on 30.09.2019 & as per minutes of meeting, estimated cost of proposed Transmission scheme for transfer of 8.1 GW Renewable generation under ISTS (Phase – II) is about Rs 12,191 Crs.
- c) In addition to above, during 6th NCT meeting held on 30/09/2019, spare



ICTs/ reactors are agreed as below:

Substation	ICT	Bus Reactor
765/400kV Sikar-II S/s	765/400 kV, 500 MVA single phase ICT	110 MVAR, 765 kV, 1 ph Reactor
765/400kV Narela S/s	765/400 kV, 500 MVA single phase ICT	110 MVAR, 765 kV, 1 ph Reactor

D. Revised Project Inception Report

Revised Project Inception Report for transmission system strengthening for potential solar energy zones (11.1GW) – Phase -II in Northern Region (8.1GW under ISTS and balance 3.0 GW under Intra-State by RVPN) has been submitted.

E. Results of system studies carried out by the Petitioner and comments/ suggestions of stakeholders and its treatment

- a) The details of the scheme approved vide 4th NRSCT meeting, its justification, estimated cost and its tariff impact, results of the system studies, study assumptions, stakeholder consultation/ approval details etc. were published on the Petitioner's website on 14.08.2019.
- b) Subsequently, RVPNL vide their email dated 29.08.2019 has informed that they agree technically to the transmission system associated with evacuation of solar capacity of 8.9 GW in Phase-I and 8.1 GW in Phase-II under SEZ in Rajasthan which was discussed and agreed in the 4th NRSCT meeting held on dated 25.07.2019.
- c) They further mentioned that it was also discussed in aforesaid meeting that this forum may recommend to Government of India that the transmission system being proposed for RE evacuation should be developed through Viability Gap Funding (VGF) mode or Government may provide finance from central assistance so that its impact through PoC mechanism is reduced on the Discoms. In this regard, they attached letter which was sent to the CEA for incorporating the same in the Minutes of Meeting of 4th NRSCT. Rajasthan requested to include the above comments on the subject scheme.



d) Subsequently, considering techno-economic viability and timeframe for implementation, the scheme was revised to EHVAC transmission system and the same was discussed and agreed in 5th NRSCT meeting held on 13.09.2019. The above issues raised by RVPNL were also noted in the MOM.

e) Accordingly, the details of the revised EHVAC scheme, its justification, estimated cost and its tariff impact, results of the system studies, study assumptions, stakeholder consultation/ approval details etc. were published on the Petitioner's website on 20.09.2019.

f) Further, regarding funding, CERC vide order dated 09.08.2019 has accorded regulatory approval for implementation of transmission system associated with Solar Energy Zones (8.9 GW) in Rajasthan Phase-I. In the order, following was mentioned:

“CTU shall ensure that the cost of implementation shall not be passed on to the consumers in any way till the solar generators are commissioned. CTU may seek other remedies such as grants & subsidies from GOI/ State Governments in this regard”.

g) The matter regarding funding, as directed by CERC, has already been taken up with Ministry of Power, vide letter dated 28.08.2019 for suitable addressal.

h) The details of the application received for Stage-II Connectivity and LTA under Phase-I and Phase-II are placed below:

District	Taluk/Tehsil	Total Potential (GW)	Ph-1(GW) 2020			Ph-2(GW) 2021		
			Potential (GW)	St-II Con. (GW)	LTA (GW)	Potential (GW)	St-II Con. (GW)	LTA (GW)
Jaisalmer	Kuchhri	4.00	-	-	-	4.00	-	-
	Fatehgarh	5.70	3.50	3.7	2.8	2.20	-	-
Jodhpur	Phalodi/Bhadla	5.30	3.55	2.6	2.2	1.75	-	-
Bikaner	Koyalat /Pugal	5.00	1.85	2.1	1.8	3.15	-	-
Total		20	8.90	8.4	6.8	11.1*	-	-

* Includes 3 GW (2.1 GW at Jaisalmer, 0.7 GW at Jodhpur & 0.2 GW at Bikaner) under Intra State Transmission system of Rajasthan

Hearing held on 12.2.2020



7. During the hearing, representative of the Petitioner submitted that LTA Applications for approximately 8,600 MW and Stage-II Connectivity applications for 14,300 MW have been received for combined Phase-I and Phase-II projects. Most of these Stage-II applications are based on LOA by bidding agencies and it is expected to be converted into LTA. He further submitted that they have filed details of requirement of additional future space and spares.

8. After hearing the Representative of the Petitioner, the Commission directed the Petitioner to file the updated details of applications received for Stage-II Connectivity and LTA applications under Phase-I and II transmission system and consolidated scope of transmission system covered under the instant regulatory approval.

9. In compliance to the direction of the Commission vide ROP of hearing dated 12.2.2020, the Petitioner vide affidavit dated 25.2.2020 has submitted as under:

a) Details regarding applications received for Stage-II Connectivity and LTA applications pertaining to Phase-I and II Transmission System are as per below:

District	Taluk/Tehsil	Total Potential (GW)	Ph-1(GW) Dec 2020	Ph-2(GW) Dec 2021	Applications Received for Phase-I & Phase-II (GW)	
			Potential	Potential	St-II Con.	LTA
Jaisalmer	Kuchhri	4.00	-	4.00	1.0	-
	Fatehgarh	5.70	3.50	2.20	6.67	4.14
Jodhpur	Phalodi/Bhadla	5.30	3.55	1.75	4.53	2.375
Bikaner	Koyalat /Pugal	5.00	1.85	3.15	2.1	2.1
Total		20	8.90	11.1*	14.3	8.615

* Includes 3 GW (2.1 GW at Jaisalmer, 0.7 GW at Jodhpur & 0.2 GW at Bikaner) under Intra State Transmission system of Rajasthan

Most of the Stage-II connectivity applications are based on LOAs by bidding agencies and it is expected that these applications would be converted into LTA.



b) The consolidated scope along with future space and spare ICTs/ reactors of aforesaid schemes is given below:

- I. Establishment of 400/220kV, 4x500 MVA pooling station at suitable location near Ramgarh/Kuchheri in Distt Jaisalmer (Ramgarh-II PS) with 2x125 MVA bus reactor at 400kV level.
- II. Ramgarh-II PS –Fatehgarh-II PS 400 kV D/c Line (Twin HTLS*)
- III. Ramgarh-II PS – Jaisalmer-II (RVPN) 400 kV D/c Line (Twin HTLS*)
- IV. Establishment of 400/220kV, 6x500MVA pooling station at suitable location near Bikaner (Bikaner-II PS) with 2x125 MVA bus reactor at 400kV level and with suitable bus sectionalisation at 400 kV level and 220 kV level.
- V. Bikaner-II PS – Khetri 400kV 2xD/c line (Twin HTLS* line on M/c tower)
- VI. 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) upto Bikaner-II PS to form Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line)
- VII. 1x80 MVA Switchable line reactor for each circuit at each end of Bikaner-II – Khetri 400kV 2xD/c line
- VIII. Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Sikar (Sikar-II Substation) with 1x125 MVA at 400kV level & 2x330 MVA bus reactors at 765kV level at Sikar -II
- IX. Sikar-II – Aligarh 765kV D/c line
- X. Bhadla-II PS – Sikar-II 765kV 2xD/c line
- XI. Sikar-II – Neemrana 400kV D/c line (Twin HTLS*)
- XII. 1x330 MVA Switchable line reactor for each circuit at Sikar-II end of Bhadla-II – Sikar-II 765kV 2xD/c line
- XIII. 1x240 MVA Switchable line reactor for each circuit at Bhadla-II end of Bhadla-II – Sikar-II 765kV 2xD/c line
- XIV. 1x330MVA Switchable line reactor for each circuit at each end of Sikar-II –Aligarh 765kV D/c line
- XV. Augmentation with 765/400kV, 2x1500MVA transformer (5th & 6th) at Fatehgarh-II PS
- XVI. Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2nd)
- XVII. 1x240 MVA Switchable line reactor for each circuit at each end of Fatehgarh-II – Bhadla-II 765kV D/c line
- XVIII. Augmentation with 400/220kV, 4x500MVA transformer (6th to 9th) at Fatehgarh-II PS with suitable bus sectionalisation at 400 kV & 220 kV
- XIX. Augmentation with 765/400kV, 1x1500MVA transformer (4th) at Bhadla-II PS.
- XX. Augmentation with 400/220kV, 3x500MVA transformer (6th to 8th) at Bhadla-II PS with suitable bus sectionalisation at 400 kV & 220 kV
- XXI. Khetri - Bhiwadi 400kV D/c line (Twin HTLS*)#
- XXII. Power reversal on \pm 500kV, 2500MW Balia – Bhiwadi HVDC line upto 2000MW from Bhiwadi to Balia in high solar generation scenario
- XXIII. 220kV line bays for interconnection of solar projects at Bikaner-II PS (10 nos.),



- Ramgarh-II PS (7 nos), Fatehgarh-II PS (7 nos) & Bhadla-II PS (4 nos)
- XXIV. Establishment of 765/400 kV, 3X1500 MVA GIS substation at Narela with 765 kV (2x330 MVAR) bus reactor and 400kV (1x125 MVAR) bus reactor.
- XXV. Khetri – Narela 765 kV D/c line
- XXVI. 1x330 MVAR Switchable line reactor for each circuit at Narela end of Khetri – Narela 765kV D/c line
- XXVII. LILO of 765 kV Meerut- Bhiwani S/c line at Narela
- XXVIII. 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.
- XXIX. STATCOM:
 Fatehgarh – II S/s: STATCOM: ± 600 MVAR, 4x125 MVAR MSC, 2x125 MVAR MSR
 Bhadla – II S/s: STATCOM: ± 600 MVAR, 4x125 MVAR MSC, 2x125 MVAR MSR
 Bikaner – II S/s: STATCOM: ± 300 MVAR, 2x125 MVAR MSC, 1x125 MVAR MSR

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

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

Spare ICTs/Reactors:

Substation	ICT	Bus Reactor
765/400kV Sikar-II S/s	765/400 kV, 500 MVA single phase ICT	110 MVAR, 765 kV, 1 ph Reactor
765/400kV Narela S/s	765/400 kV, 500 MVA single phase ICT	110 MVAR, 765 kV, 1 ph Reactor
765/400kV Aligarh S/s	-	110 MVAR, 765 kV, 1 ph Reactor

Future Space Provisions:

400/220kV Ramgarh-II PS

Space for:

400/220 kV ICTs along with bays: 2

400 kV line bays along with switchable line reactor: 2

220 kV line bays: 4

420 kV reactors along with bays: 1

765/400kV Sikar-II PS

Space for:

765/400kV ICT along with bays: 2

765 kV line bays along with switchable line reactors: 10



400 kV line bays along with switchable line reactor: 6
400/220kV ICT along with bays: 4
220kV bays: 8
400kV bus reactor: 2

400/220kV Bikaner-II PS

Space for:
400/220 kV ICTs along with bays: 4
400 kV line bays: 6
220 kV line bays: 6
420 kV reactors along with bays: 2

765/400kV Narela S/s

Space for:
765/400kV ICT along with bays: 1
765 kV line bays along with switchable line reactors: 6
765kV reactor along with bays: 2
400 kV line bays: 10
400/220kV ICT along with bays: 8
220kV bays: 12
400kV bus reactor along with bays: 2

Analysis and Decisions

10. The Government of India has set a target for establishing 175 GW renewable capacity by 2022 which includes 100 GW Solar, 60 GW Wind, 10 GW Bio-Power and 5 GW small hydro generation capacities. For the fulfillment of this ambitious target of 175 GW renewable capacity, the Petitioner has planned development of transmission capacity for 66.5 GW Renewable Energy through potential Solar Energy Zones (SEZs) and potential Wind Energy Zones (WEZs) in 7 nos. RE rich States identified by SECI/ MNRE. These identified RE rich states are Tamil Nadu, Andhra Pradesh, Karnataka, Gujarat, Rajasthan, Maharashtra and Madhya Pradesh.



11. The Petitioner has submitted that the aforementioned RE capacity of 66.5 GW has been bifurcated among SEZ and WEZ as 50 GW and 16.5 GW respectively. Further, the Petitioner submitted the region-wise bifurcation of the said 66.5 GW capacity as 20 GW solar generation in Rajasthan, 28 GW wind and solar generation in Western Region and 18.5 GW wind and solar generation in Southern Region. The Petitioner has envisaged the implementation of transmission scheme w.r.t. above mentioned RE capacity of 66.5 GW. This transmission scheme is envisaged to be implemented in two phases progressively.

12. Out of the aforementioned 66.5 GW, the present Petition involves the execution of the transmission system associated with 11.1 GW of RE potential in Solar Energy Zones in Rajasthan. The Petitioner has submitted that out of the instant 11.1 GW capacity, transmission system for 3.0 GW capacity is to be built under intra-State system by Rajasthan while rest 8.1 GW capacity has to be built as ISTS.

13. The transmission scheme for implementation of Phase-II of 8.1 GW capacity was initially discussed and agreed by NR constituents in the 3rd and 4th meeting of Northern Regional Standing Committee for Transmission (NRSCT) held on 24.05.2019 and 25.07.2019 respectively wherein Hybrid system involving VSC based HVDC system transmission schemes was finalized.

14. Subsequently, the transmission scheme was discussed in the 5th NRSCT meeting held on 13.9.2019. Considering the difficulty in implementation of the hybrid scheme by December 2021 and high cost of the HVDC system, revised transmission scheme comprising of AC system was proposed. In the said meeting, 3 alternatives of EHVAC



systems were discussed. The Alternative-1 involved Modipuram (UPPTCL) which is presently under tendering and accordingly its commissioning by December 2021 is uncertain. Regarding Alternative-2, HVPNL opined that the option includes additional 765/400kV S/s at Kadarapur and, hence, is costlier than Alternatives 1 and 3.

15. After detailed deliberations, revised EHVAC transmission scheme with Alternative – 3 (Aligarh) was agreed in the aforementioned meeting and proposal of HVDC systems were deleted from the earlier agreed transmission systems. The revised consolidated EHVAC system agreed for evacuation of RE power from Phase-II projects has been mentioned above at Para 9(b).

16. The revised EHVAC Transmission scheme was also taken up for discussion in 46th meeting of Northern Regional Power Committee (NRPC) held on 24.09.2019. Subsequently, the scheme has also been discussed in 6th NCT meeting held on 30.09.2019 and as per minutes of the meeting, estimated cost of proposed transmission scheme for transfer of 8.1 GW RE generation under ISTS (Phase-II) is about Rs 12,191 crores.

17. The Petitioner has submitted that the details of the revised EHVAC scheme, its justification, estimated cost and its tariff impact, results of the system studies, study assumptions, stakeholder consultation/ approval details etc. were published on the Petitioner's website on 20.09.2019 and no observations have been received from the constituents.



18. The key differences in the Project Inception Report filed by CTU in the instant Petition vide main Petition and vide latest affidavit dated 18.11.2019 after finalization of the scheme for the Regulatory Approval are mentioned below:

	Vide Main Petition	Vide latest affidavit dated 18.11.2019
Scheme	11.1 GW (8.1 GW in ISTS and 3 GW in intra-State by RVPNL)	11.1 GW (8.1 GW in ISTS and 3 GW in intra-State by RVPNL)
Scope	EHVAC – 24 Elements and VSC, HVDC – 5000 MW	EHVAC – 29 Elements (HVDC system removed).
Estimated Cost	17025 crore	12191 crore
Estimated Transmission Tariff/ Year (17%)	2894 crore	2072 crore
Energy generated (Million Units) – 8.1 GW	14192 (CUF – 20%)	17739 (CUF – 25%)
Energy Handled @ Rs. 2.5/ Unit	3584 crore	4434 crore
Transmission Charges/ Unit	Rs. 2.04	Rs. 1.168

19. The Petitioner vide affidavit dated 25.2.2020 has submitted the details regarding applications received for Stage-II Connectivity and LTA applications for both Phase-I and II transmission system jointly, which is as follows:

District	Taluk/Tehsil	Total Potential (GW)	Ph-1(GW) Dec 2020	Ph-2(GW) Dec 2021	Applications Received for Phase-I & Phase-II (GW)	
			Potential	Potential	St-II Con.	LTA
Jaisalmer	Kuchhri	4.00	-	4.00	1.0	-
	Fatehgarh	5.70	3.50	2.20	6.67	4.14
Jodhpur	Phalodi/Bhadla	5.30	3.55	1.75	4.53	2.375
Bikaner	Koyalat /Pugal	5.00	1.85	3.15	2.1	2.1
Total		20	8.90	11.1*	14.3	8.615

* Includes 3 GW (2.1 GW at Jaisalmer, 0.7 GW at Jodhpur & 0.2 GW at Bikaner) under Intra State Transmission system of Rajasthan



The Petitioner has also submitted that most of the Stage-II connectivity applications received are based on LOAs by bidding agencies and they are expected to be converted into LTA.

20. The provisions of Regulation 3(1) and 3(2) of the Regulatory Approval Regulations provide as under:

“3. Scope and applicability

(1) These regulations shall apply to:

(i) an ISTS Scheme proposed by Central Transmission Utility, for which generators have sought long-term access as per the Central Electricity Regulatory Commission (Grant of Connectivity, Long-Term Access and Medium Term Open Access to the Inter-State Transmission and Related Matters) Regulations, 2009, and for which consultation with Central Electricity Authority and beneficiaries if already identified has been held for setting up the ISTS Scheme, but for which Power Purchase Agreements with all the beneficiaries have not been signed on the date of application.

(ii) an ISTS Scheme for system strengthening/up-gradation, identified by Central Transmission Utility to enable reliable, efficient, co-ordinated and economical flow of electricity within and across the region for which consultation with Central Electricity Authority and beneficiaries if identified has been held.

(iii) ISTS Scheme proposed by CTU, for which the Central Government authorised Solar Power Park Developer has sought long term access, and for which consultation with CEA and beneficiaries wherever identified has been held for setting up the ISTS scheme and the Solar Power Park Developer undertakes to bear all liabilities on behalf of the solar power generators to be set up in the Solar Park.

(2) These regulations shall not apply to ISTS Scheme, for which all the beneficiaries/ respective STUs have signed Bulk Power Transmission Agreement to share the transmission charges.”

21. Regulation 3(1)(i) of the Regulatory Approval Regulations apply to the ISTS scheme for which the generators have sought LTA. However, for the identified transmission system proposed to be constructed by the Petitioner, full quantum of LTA has not yet been sought by the generators. The Petitioner has submitted that for part of combined Phase-I and II



capacities i.e. 20 GW, LTA applications have been received for 8.6 GW and Stage-II Connectivity Applications have been received for 14.3 GW. Recognizing the fact that the instant Petition is not covered under Regulation 3(1)(i) of the Regulatory Approval Regulations, the representative of the Petitioner prayed that the Commission, in exercise of its power under Regulation 8 of the Regulatory Approval Regulations, relax the provisions of the said regulations and grant the reliefs prayed for. The Petitioner has also submitted that the proposed transmission system has been envisaged keeping in view the generation potential as assessed by MNRE/ agencies of MNRE.

22. In the meanwhile, the Ministry of Power, Gol on 11.7.2019 has issued directions under Section 107 of the 2003 Act with regard to the Regulatory approval of the transmission schemes envisaged for RE resources, as under:

“Subject: Direction to the Central Electricity Regulatory Commission under Section 107 of the Electricity Act, 2003 in regard to regulatory approval of the transmission schemes identified for 68.5.GW of RE projects-Regarding

Sir,

As a part of the steps necessary to fulfill the commitment made by India under the Nationally Determined Contribution pursuant to the Paris Agreement on Environment, Government of India have decided to set up 175 GW of RE capacities in the country by the year 2022. As of May 2019 about 80 GW of RE generation has already been commissioned and the balance 95 GW has to come up in the next 3 years. In order to achieve above targets, MNRE in consultation with CEA and CTU has identified transmission schemes for around 66.5 GW of RE generation, comprising around 28 GW under Phase-I and around 38.5 GW under Phase-II as part of National Renewable Energy Mission of setting up of 175 GW of RE capacity.

2. As the gestation period of RE projects is much shorter in comparison to the implementation period of the transmission facilities, and significant quantum of RE capacity targeted to be tendered out in the current financial year, it is necessary that the present system of transmission planning and implantation of RE projects need to be carried out in Mission Mode. The transmission activities need to be started much ahead of the generation so that both of them are completed in matching time-frame to achieve the target set up Govt. of India. Thus, in the said background, it has been decided by the Government to accord the identified schemes for aforementioned 66.5 GW of RE generation, comprising around 28 GW under Phase-I AND 38.5 GW under Phase-II as —Projects of National Importance”. Accordingly, the Central Government, in exercise of the powers conferred



under Section 107 of the Electricity Act, 2003 hereby issues following directions to the Central Electricity Regulatory Commission in respect of these projects of national importance:

- (i) To accord Regulatory approval for the transmission system associated with 12.5 GW of RE capacity in Phase-I for which CTU has already applied to CERC for regulatory approval;
- (ii) To give regulatory approval expeditiously, for balance 15.5 GW under phase-I and 38.5 GW under phase-II on submission of the application by CTU for the regulatory approval.
- (iii) Prior requirement of LTA applications and associated Bank Guarantees, to be deferred for the interim period till the RE project is awarded to successful bidder, for taking up the implementation of associated transmission systems for balance RE capacity under 66.5 GW of RE. It is however, clarified that the due regulatory procedure of LTA and Connectivity will be followed by the successful bidder.”

23. Section 107 of the 2003 Act is extracted under:

“Section 107. (Directions by Central Government): --- (1) In the discharge of its functions, the Central Commission shall be guided by such directions in matters of policy involving public interest as the Central Government may give to it in writing.

(2) If any question arises as to whether any such direction relates to a matter of policy involving public interest, the decision of the Central Government thereon shall be final.”

24. Therefore, in matters of policy involving public interest, the Commission is guided by the directions issued by the Central Government under the Section 107 of the 2003 Act. Similar provisions are contained in Section 108 of the 2003 Act. With regard to the directions of the State Government under Section 108 of the 2003 Act, we take note of the observations of the Appellate Tribunal for Electricity (APTEL) in its judgment dated 4.10.2012 in Appeal No. 200 of 2011 (M/s Maruti Suzuki India Ltd. vs Haryana Electricity Regulatory Commission & Ors.) as under:

“28. Section 78A of Electricity (Supply) Act 1948 and Section 12 of DERA 2000 were similar to Section 108 of the 2003 Act. These sections are set out as under:

Section 108 of the Electricity Act, 2003: Directions by State Government. —

(1) In the discharge of its functions, the State Commission shall be guided by such directions in matters of policy involving public interest as the State Government may give to it in writing.



(2) If any question arises as to whether any such direction relates to a matter of policy involving public interest, the decision of the State Government thereon shall be final.

29. The Hon'ble Supreme Court in the case of APTRANSCO vs Sai Renewable Energy Pvt. Ltd. [(2011)11SCC 34] has held that State Commission is not bound by any policy directions issued by the Government under the Act if such directions hamper the statutory functions of the Commission. The relevant extracts of the Hon'ble Supreme Court's judgment dated 8.7.2010 is quoted below:

"27. The Reform Act, 1998 was enacted, primarily, with the object of constituting two separate corporations; one for generation and other for transmission and distribution of electrical energy. The essence was restructuring, so as to achieve the balance required to be maintained in regard to competitiveness and efficiency on the one part and the social objective of ensuring a fair deal to the consumer on the other. This Act is also intended for creation of a statutory regulatory authority. Section 3 of the Act requires the State Govt. to establish by notification a Commission to be known as Andhra Pradesh Electricity Regulatory Commission. This was done by notification dated 3rd April, 1999. As already noticed, Section 11 detailed the functions of the Regulatory Commission and primarily it had advisory as well as regulatory functions. In terms of Section 11(1)(c) it was required to issue licenses in accordance with the provisions of the Act and determine the conditions to be included in the license. However, 11(1)(e) gave it much wider power and duty to regulate the purchase, distribution, supply and utilization of electricity, the quality of service, the tariff and charges payable keeping in view both the interest of the consumer as well as the consideration that the supply and distribution cannot be maintained unless the charges for the electricity supplied are adequately levied and duly collected. In terms of Section 11(1)(l) it was to undertake all incidental or ancillary things to the functions assigned to it under the provisions of the Act. Section 12 of the Act vests the State Govt. with the power to issue policy directions on matters concerning electricity in the State including the overall planning and co-ordination. All policy directions shall be issued by the State Govt. consistent with the objects sought to be achieved by this Act and, accordingly, shall not adversely affect or interfere with the functions and powers of the Regulatory Commission including, but not limited to, determination of the structure of tariffs for supply of electricity to various classes of consumers. The State Govt. is further expected to consult the Regulatory Commission in regard to the proposed legislation or rules concerning any policy direction and shall duly take into account the recommendation by the Regulatory Commission on all such matters. Thus the scheme of these provisions is to grant supremacy to the Regulatory Commission and the State is not expected to take any policy decision or planning which would adversely affect the functioning of the Regulatory Commission or interfere with its functions. This provision also clearly implies that fixation of tariff is the function of the Regulatory Commission and the State Govt. has a minimum role in that regard. Chapter VII of this Act deals with tariff. In terms of Section 26(2), the Regulatory Commission, in addition to its power of issuing licence, is entitled to fix terms and conditions for determination of the licensee's revenue and tariffs by regulations which are to be duly published. The expression 'tariff' has not been defined in any of the Acts, with which we are concerned in the present appeals, despite the fact that the expression 'tariff' has been used



repeatedly in both the Acts. Under the Electricity Act, 2003 'tariff' has neither been defined nor explained in any of the provisions of the Act. Explanation (b) to Section 26 of the Reform Act, 1998 states what is meant by 'tariff'. This provision states that 'tariff' means a schedule of standard price or charges or specified services which are applicable to all such specified services provided to the type or types of customers specified in the 'tariff' notification. This is an explanation to Section 26 which deals with licenses, revenues and tariffs. In other words, this explanation may not be of greater help to the Court in dealing with the case of generating companies. Similarly, the expression 'purchase price' has neither been defined nor explained in any of the afore-stated Acts.¶ {Emphasis added}.

30. Thus, the judgments cited by the Appellant as above have been overruled by the Hon'ble Supreme Court in APTRANSCO vs Sai Renewable Energy Pvt. Ltd. [(2011)11SCC 34].

31. Further, this Tribunal in Polyplex Corporation vs Utrkhand Electricity Regulatory Commission in Appeal no. 41, 42 and 43 of 2010 has held that —

“The State Commission is independent statutory body. Therefore the policy directions issued by the State Government are not binding on the State Commission, as those directions cannot curtail the power of the State Government (sic Commission) in the matter of determination of tariff. The State Government may have given any such policy direction in order to cater to the popular demand made by the public but while determining tariff the State Commission may take those directions or suggestions for consideration but it is for the State Commission which has statutory duty to perform either to accept the suggestion or reject those directions taking note of the various circumstances. It is purely discretionary on the part of the State Commission on acceptability of the directions issued by the State Government in the matter of determination of tariff.”

Thus, the directions issued under Section 107 or 108 of the 2003 Act, as the case may be, shall be in matters of policy involving public interest and for the implementation of the provisions of the 2003 Act.

25. The Commission while specifying the terms and conditions of tariff, shall be guided by provisions of Section 61 of the 2003 Act which is extracted below:

“Section 61. (Tariff Regulations):

The Appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the following, namely:-

(a) the principles and methodologies specified by the Central Commission for determination of the tariff applicable to generating companies and transmission licensees;



- (b) the generation, transmission, distribution and supply of electricity are conducted on commercial principles;
- (c) the factors which would encourage competition, efficiency, economical use of the resources, good performance and optimum investments;
- (d) safeguarding of consumers' interest and at the same time, recovery of the cost of electricity in a reasonable manner;
- (e) the principles rewarding efficiency in performance;
- (f) multi year tariff principles;
- (g) that the tariff progressively reflects the cost of supply of electricity and also, reduces cross-subsidies in the manner specified by the Appropriate Commission;
- (h) the promotion of co-generation and generation of electricity from renewable sources of energy;
- (i) the National Electricity Policy and tariff policy:
Xxxx”

26. Section 178 of the 2003 Act provides the Commission the power to make regulations while Section 79 of the said Act provides for the following functions of the Commission:

- “79. (1) The Central Commission shall discharge the following functions, namely:-*
- (a) to regulate the tariff of generating companies owned or controlled by the Central Government;*
 - (b) to regulate the tariff of generating companies other than those owned or controlled by the Central Government specified in clause*
(a), if such generating companies enter into or otherwise have a composite scheme for generation and sale of electricity in more than one State;
 - (c) to regulate the inter-State transmission of electricity;*
 - (d) to determine tariff for inter-State transmission of electricity;*
 - (e) to issue licenses to persons to function as transmission licensee and electricity trader with respect to their inter-State operations.*
 - (f) to adjudicate upon disputes involving generating companies or transmission licensee in regard to matters connected with clauses (a) to (d) above and to refer any dispute for arbitration;*
 - (g) to levy fees for the purposes of this Act;*
 - (h) to specify Grid Code having regard to Grid Standards;*
 - (i) to specify and enforce the standards with respect to quality, continuity and reliability of service by licensees;*
 - (j) to fix the trading margin in the inter-State trading of electricity, if considered, necessary;*
 - (k) to discharge such other functions as maybe assigned under this Act.”*

27. The Commission, in exercise of its powers under Section 79(1)(c) read with subsection (1) and clause (ze) of subsection (2) of Section 178 of the 2003 Act has notified the Regulatory Approval Regulations. In terms of Section 61(h) of the 2003 Act,



the Commission has taken a number of regulatory initiatives for the development of RE sources and for the smooth integration of RE in the grid. In order to facilitate effective integration of variable and uncertain RE generation, the Commission has specified Roadmap for Reserves, framework for Ancillary Services Operation besides amending the IEGC, which provides for technical minimum of 55% in case of thermal generating units aimed at providing flexibility to respond to the needs of variation in demand, RE generation etc. Besides the above, the Commission has also brought in several regulatory interventions for promoting renewable energy generation, which inter alia include, notification of Renewable Energy Certificate Mechanism, Framework for Scheduling, Forecasting & Deviation Settlement of RE generation, specifying Relaxation in Deviation Settlement Mechanism for RE generation etc.

28. The Central Government has, as a part of 175 GW, set a target for addition of 66.5 GW of RE and there is an immediate need to construct transmission lines for evacuation of RE power. In terms of this, the CTU/ CEA have prepared a plan for development of transmission lines that should precede the RE generation projects. These have been placed before the respective Standing Committees and Regional Power Committees for consideration and approval. Out of projected 66.5 GW RE generation, the development of transmission system associated with 8.1 GW is involved in the State of Rajasthan that is subject matter of the instant Petition.

29. On a conjoint reading of the submissions of the Petitioner and the direction of the Government of India in para 2(iii) of afore-mentioned letter dated 11.7.2019, it can be inferred that the requirements of LTA applications and associated Bank Guarantees are



required to be deferred for the interim period till the respective RE projects are awarded to the successful bidders and that due regulatory procedure of LTA and connectivity will be followed by these successful bidders.

30. The Commission vide order dated 10.10.2019 in Petition No. 197/MP/2019 has observed the following:

“59. We observe that timeline for renewable capacity beyond 2021 has not been specified. The Petitioner vide Affidavit dated 1.10.2019 has submitted “Minutes of meeting regarding prioritization of transmission system associated with 66.5 GW potential RE capacity already planned, based on inputs from SECI/MNRE held on 30.08.2019 at CEA, New Delhi” whereby following is recorded:

“SECI informed that as per their bidding guidelines, generation capacity is to be commissioned within 24 months from the date of bidding. Accordingly, it was decided that transmission schemes for the Phase-III potential capacity at various locations may be kept ready for implementation. The necessary approvals for the transmission schemes from NCT, ECT, MoP needs to be in place so that bidding for the transmission schemes could be started as soon as State Government confirms land/reservoir availability for setting up of RE projects. Once SECI starts bidding process for the Phase-III potential REZ capacity, SECI will inform to MOP, CEA & CTU the commissioning schedule of generation projects so that activities for implementation/bidding of respective transmission schemes may be taken up. In case land availability for any part of Phase-III projects is confirmed in near future, the scheme needs to be taken up on priority.”

In line with the above, it is directed that Petitioner shall ensure that transmission system is taken up for implementation matching with progress of generation projects as suggested above.”

31. Accordingly, it is directed that Petitioner shall ensure that transmission system is taken up for implementation matching with progress of generation projects as suggested above.

32. Further, we observe that although the scheme comprising 29 elements has been uploaded on website for stakeholder’s comments, additional scope of spare ICT, spare Reactors and space provision for future bays have been approved in 6th NCT but the same



has not been uploaded on website of CTU for stakeholder's comments nor have been discussed in RPC meeting. As per CERC (Planning, Coordination and Development of Economic and Efficient Inter-State Transmission System by Central Transmission Utility and other related matters) Regulations, 2018, Petitioner is directed to upload the said elements of the scheme on website for stakeholder's comments and discuss the same in RPC meeting before taking up these elements for execution.

33. As stated earlier, the Petition for grant of Regulatory approval does not squarely fall under the provisions of Regulation 3(1)(i) of the Regulatory Approval Regulations. However, the Petitioner has prayed that the Commission may exercise the Power to relax under Regulation 8 of the Regulatory Approval Regulations. Therefore, considering the fact that the scheme is of national importance as mentioned by the Ministry of Power in its letter dated 11.7.2019 and with due regard to the guiding principle of promoting renewable energy as enshrined under Section 61(h) of the 2003 Act, in exercise of our Powers under Regulation 8 of the Regulatory Approval Regulations, we relax the provisions of Regulation 3(1)(i) of the Regulatory Approval Regulations and subject to our observations at paragraph 32 above, grant Regulatory approval for execution of the proposed transmission system enlisted at Para 9(b) of this Order. Having done so, the issues and concerns expressed by the Discoms and other stakeholders are also required to be balanced while granting such relief, especially when the Ministry of Power, Government of India has accorded the said transmission system the status of national importance. The Commission is also guided by the principles, as provided under Section 61(d) of the 2003 Act i.e. safeguarding of consumer's interest and at the same time, recovery of the cost of



electricity in a reasonable manner. Thus, the Commission has a statutory responsibility to balance the interest of developers and consumers of electricity. Accordingly, the regulatory approval granted above is subject to the condition that the Discoms and consumers shall be liable for payment of transmission charges after the renewable generating stations achieve the COD.

34. The transmission charges for transmission system approved herein shall be recovered as per CERC (Sharing of inter-state transmission charges and losses) Regulations, 2010 or CERC (Sharing of inter-state transmission charges and losses) Regulations, 2020, as applicable, after the associated generating stations achieve COD. In case of mismatch between the date of commercial operation of generating station and transmission system, the liability of payment of transmission charges shall be governed by Regulation 6 of CERC (Terms and Conditions of Tariff) Regulations, 2019. The CTU, as far as possible, shall endeavor to match or phase out the construction of transmission systems according to the progress of the RE generating stations, in consultation with MOP and MNRE so as to minimise any financial impact on distribution companies in case the transmission assets remain unutilized due to delay or non-materialization of envisaged generation projects. In case the generating stations as envisaged do not materialize and transmission system is commissioned, CTU may seek appropriate remedies such as grants and/or subsidies from Central/ State Governments till the associated generating stations achieve COD. CTU may also approach the Commission for appropriate relief and directions.



35. CTU shall submit quarterly progress report as regards execution of the approved transmission scheme to the Ministry of Power, GOI and CEA. The report shall contain pace of construction of transmission systems and the extent of LTAs granted and the PPAs signed.

36. Petition No. 269/MP/2019 is disposed of in terms of the above.

sd/-

(I.S Jha)
Member

sd/-

(P.K.Pujari)
Chairperson

