

Resource Adequacy Plan for Transmission System of Andhra Pradesh up to the year 2034-35

Government of India
Ministry of Power
Central Electricity Authority





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Executive Summary

Andhra Pradesh has been one of India's fastest-growing states, with significant progress in various sectors, including industry, agriculture, infrastructure, and services. Andhra Pradesh, a key economic hub in India, has made significant strides in its energy sector to fuel its rapid economic growth. Andhra Pradesh is one of India's leading states in solar and wind energy production due to its high solar radiation and coastal region. Andhra Pradesh is home to large solar and wind farms, particularly in regions like Ananthapuram, Kurnool and Kadapa.

The installed generation capacity (Intra-state) in the State of Andhra Pradesh is around 21.85 GW as on 31st March, 2026 (including renewable energy generation capacity of around 8.51 GW), the istalled generation capacity is planned to be increased to 37.75 GW by 2029-30 and 66.58 GW by 2034-35. As on March, 2026, around 16 GW Renewable Energy capacity (including large Hydro) has been commissioned in Andhra Pradesh (ISTS and Intra-State combined). Transmission system for integration of around 62 GW of RE (ISTS and Intra-State combined) has already been planned which are under various stages of implementation.

Andhra Pradesh has witnessed an all-time high peak demand of 15,011 MW in May, 2026, which is about 14.44% higher than the peak demand of 13,117 MW in April, 2025. Normally, the State experiences peak electricity demand during the month of April-June and during day time. Also, day peak is higher than night peak almost throughout the year. Andhra Pradesh has taken various initiatives such as feeder segregation and shifting of agricultural load to day time.

Peak electricity demand in Andhra Pradesh is projected to increase to 22,091 MW by 2029-30 and to 29,720 MW by 2034-35. Andhra Pradesh's peak power demand has surged, primarily due to domestic, agriculture and industrial demand.

A comprehensive system study of the transmission network of Andhra Pradesh, both ISTS and Intra-State transmission system, has been carried out by CEA and Resource Adequacy (RA) plan of transmission network has been prepared in coordination with Transmission Corporation of Andhra Pradesh Limited (APTRANSCO), CTUIL and Grid-India. Summary of transmission system planned under ISTS and InSTS to be commissioned by 2029-30 is given below:

	765 kV	400 kV	220 kV	Total
Inter-State Transmission System (ISTS)				
Transformation Capacity (MVA)	66000	25500	-	91500
Transmission Line (ckm)	6012	900	-	6912
Intra-State Transmission System (InSTS)				
Transformation Capacity (MVA)	-	6130	15720	21850
Transmission line (ckm)	-	1618	1600.8	3218.8

Summary of transmission system planned under ISTS and InSTS to be commissioned between 2030-31 and 2034-35 is given below:

	765 kV	400 kV	220 kV	Total
Inter-State Transmission System (ISTS)				
Transformation Capacity (MVA)/HVDC (MW)	36000	13000	-	49000
Transmission Line (ckm)	4958	330	-	5288
Intra-State Transmission System (InSTS)				
Transformation Capacity (MVA)	-	17000	3200	20200
Transmission line (ckm)		5660	4580	10240

Chapter-1

Power Scenario and Existing Transmission Network in Andhra Pradesh

1.1 Background

Andhra Pradesh, a key economic hub in India, has made significant strides in its energy sector to fuel its rapid economic growth. A robust power sector is essential to sustain the state's increasing demand for electricity. Strengthening the transmission system in Andhra Pradesh is crucial to ensure that power generated can be efficiently transmitted to meet this growing electricity demand.

The state is home to several large industries like textile, chemical, petrochemicals, engineering, and cement, all of which have high electricity requirements. Production of green Hydrogen/Green Ammonia is also planned in the State on a large scale. The transmission network in Andhra Pradesh is a critical infrastructure that supports the state's power distribution, especially as it continues to expand its renewable energy capacity to be integrated to grid. APTRANSCO is the primary state-owned company responsible for establishment and managing the transmission infrastructure in Andhra Pradesh.

Andhra Pradesh has a well-established transmission system for evacuation of power from power generation centers to consumption points across the state.

Andhra Pradesh is one of India's leading states in solar and wind energy production due to its high solar radiation and coastal region. Renewable Energy integration has been planned in the State on a very large scale. Adequate transmission system needs to be planned for evacuation of power generated from the RE sources, particularly from remote areas like Kurnool, Ananthapuram and Kadapa, where large renewable parks are being developed. Investing in transmission infrastructure today will enable the state to meet the growing demand for electricity, promote industrial development and improve the quality of life of the people.

A comprehensive system study of the Transmission System of Andhra Pradesh has been carried out by CEA in association with APTRANSCO, CTUIL and Grid-India and Resource Adequacy plan has been prepared indicating the transmission capacity required to be added in Andhra Pradesh till the year 2034-35.

1.2 Present Power Scenario in Andhra Pradesh

1.2.1 Installed Generation Capacity (Intra-State)

Installed electricity generation capacity physically located in the state of Andhra Pradesh is about 21851.68 MW as on 31st March, 2026 as given in Table 1.1, 1.2 and depicted in Fig. 1.1.

Table 1.1: Details of Installed Generation Capacity in Andhra Pradesh (as on 31.03.2026)

S.No.	Generator name	Installed capacity (MW)	APDISCOMs' Contracted Capacity (MW)
1	**APGENCO (Thermal)**		
	(i) Dr.NTTPS Stage-I	420	420
	(ii) Dr.NTTPS Stage-II	420	420
	(iii) Dr.NTTPS Stage-III	420	420
	(iv) Dr.NTTPS Stage-IV	500	500
	(v) Dr.NTTPS Stage-V	800	800
	(vi) RTPP Stage-I	420	420
	(vii) RTPP Stage-II	420	420
	(viii) RTPP Stage-III	210	210
	(ix) RTPP Stage-IV	600	600
	Sub-Total (MW)		**4210**
2	**APGENCO (Hydel)**		
	(i) MACHKUND PH AP Share	120	60
	(ii) TUNGBHADRA PH AP Share	72	57.6
	(iii) USL	240	240
	(iv) LSR	460	460
	(v) DONKARAYI	25	25
	(vi) SRBEHS	770	770
	(vii) NSRCPH	90	90
	(viii) PABM	20	20
	(ix) MINI HYDRO (Chettipetta)	1	1
	(x) Nagarjunasagar Tail pond (2x25 MW)	50	50
	Sub-Total (MW)		**1773.60**
3	**Central Sector Generating Stations Allocation**		
	(i) NTPC-Ramagundam STPS St-I&II	2100	316.21
	(ii) NTPC-Ramagundam STPS St-III	500	79.16
	(iii) NTPC TALCHER- II	2000	191.38
	(iv) NTPC Simhadri st- I	1000	461.10
	(v) NTPC Simhadri st- II	1000	222.99
	(vi) NTPC Kudgi st- I*	2400	257.82
	(vii) NLC –TPS II St-1	630	53.53
	(viii) NLC –TPS II St-2	840	94.57
	(ix) NTECL Vallur*	1500	98.81
	(x) NTPL, Tuticoran (JV of NLC & TNEB)*	1000	134.64

	(xi) MAPS	440	20.14
	(xii) KAIGA 1 & 2	440	62.63
	(xiii) KAIGA 3 & 4	440	66.32
	(xiv) NNTPS (2*500)*	1000	53.48
	(xv) Kudankulam unit 1		0.00
	(xvi) NLC TPS I Exp	420	9.17
	(xvii) NLC TPS II Exp	500	10.91
	(xviii) Telangana STPP Stage-I	1600	37.88
	Sub-Total (MW)		**2170.74**
4	**Joint Sector**		
	(i) Sri Damodaram Sanjeevaiah Thermal Power Plant - Stage-I (Unit-1)	800	720
	(ii) Sri Damodaram Sanjeevaiah Thermal Power Plant - Stage-I (Unit-2)	800	720
	(iii) Sri Damodaram Sanjeevaiah Thermal Power Plant - Stage-II (Unit-3)	800	800
	(iv) Godavari Gas Power Plant	216	216
	Sub-Total (MW)		**2456**
5	**IPPs (Thermal)**		
	(i) M/s. Sembcorp Energy India Limited	1320	230.55
	(ii) M/s. Sembcorp Energy India Limited Phase – II	1320	627.00
	(iii) M/s. HNPCL	1040	1040.00
	(iv) M/s. Sembcorp Energy India Limited Phase – I	1*660	660.00
	Sub-Total (MW)		**2557.55**
6	**IPPs (Gas)**		
	(i) M/s GMR Vemagiri(GVPGL)	370	**170.61**
7	**Renewable Energy Sources**		
	(i) NCE Biomass	14	14
	(ii) NCE Bagasse	39	39
	(iii) NCE - Industrial Waste based power project	17.16	17.16
	(iv) NCE - Municipal Solid Waste Projects	35	35
	(v) NCE- Wind	3591.85	3590.5
	(vi) NCE - Solar	4805.62	4805.62
	(vii) NCE- Mini Hydel	11.9	11.9

	Sub-Total (MW)		**8513.18**
	Total (MW)		**21851.68**

* PPA disapproved for NTPC Kudgi, NTECL Valuru, NTPL, NNTPS vide APERC order dt 30.10.23

1.2.2 Electricity Demand of Andhra Pradesh

There are three Distribution companies in Andhra Pradesh, APSPDCL (Andhra Pradesh Southern Power Distribution Company Limited), APEPDCL (Andhra Pradesh Eastern Power Distribution Company Limited) and APCPDCL (Central Power Distribution Company of A.P. Ltd). Till date, Andhra Pradesh has witnessed an all-time high peak demand of 15,011 MW in May, 2026, which is about 14.44% higher than the peak demand of 13,117 MW in April, 2025. The Peak demand observed in each month during the last three years is given in Table 1.3 and depicted in Fig.1.2.

Table 1.2: Month wise peak electricity demand

Month	Peak electricity demand 2026 (MW)	Peak electricity demand 2025 (MW)	Peak electricity demand 2024 (MW)	Peak electricity demand 2023 (MW)	Peak electricity demand 2022 (MW)
January	12622	12027	12216	11433	10118
February	13510	12726	13061	11981	11342
March	14005	13107	13255	12227	12032
April	14140	13117	13418	12566	12289
May	15011	12600	13712	12653	11218
June		12255	12578	12900	11484
July		12956	10901	11584	9763
August		12875	11825	12508	11299
September		12446	12410	12372	10920
October		10508	11545	13028	9847
November		10076	11024	12084	9588
December		11586	10526	11052	10268

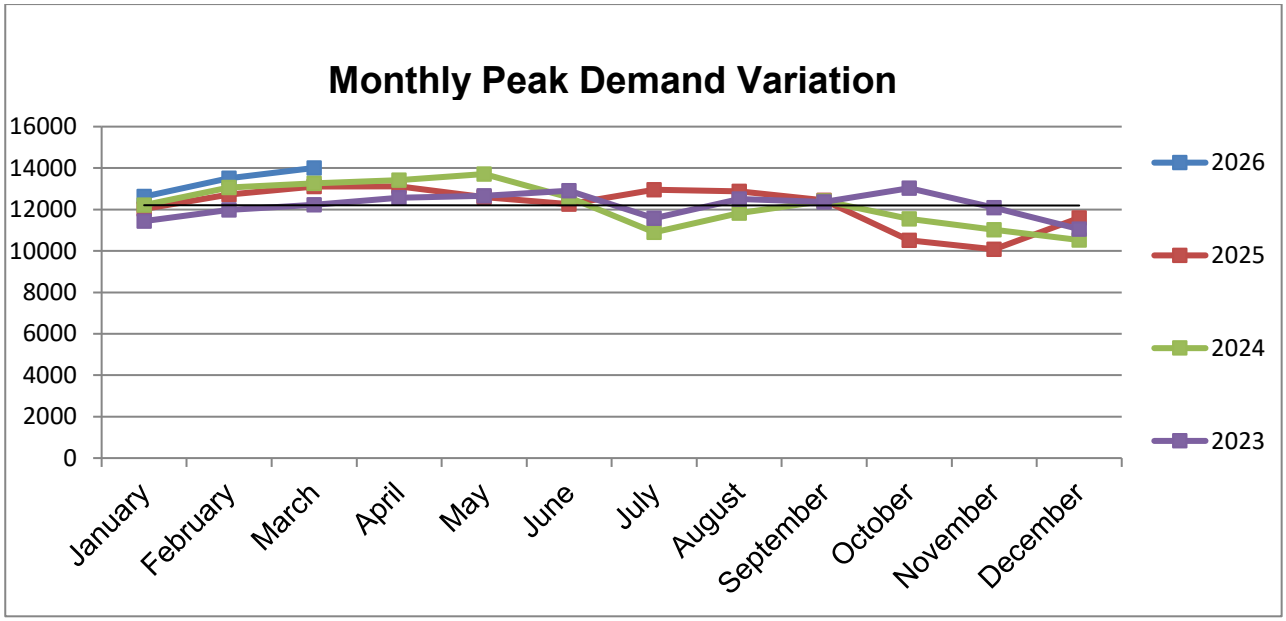

Fig. 1.1: Peak Electricity Demand Pattern in Andhra Pradesh

The daily peak demand of Andhra Pradesh in 2025-26, is shown in Fig. 1.3.

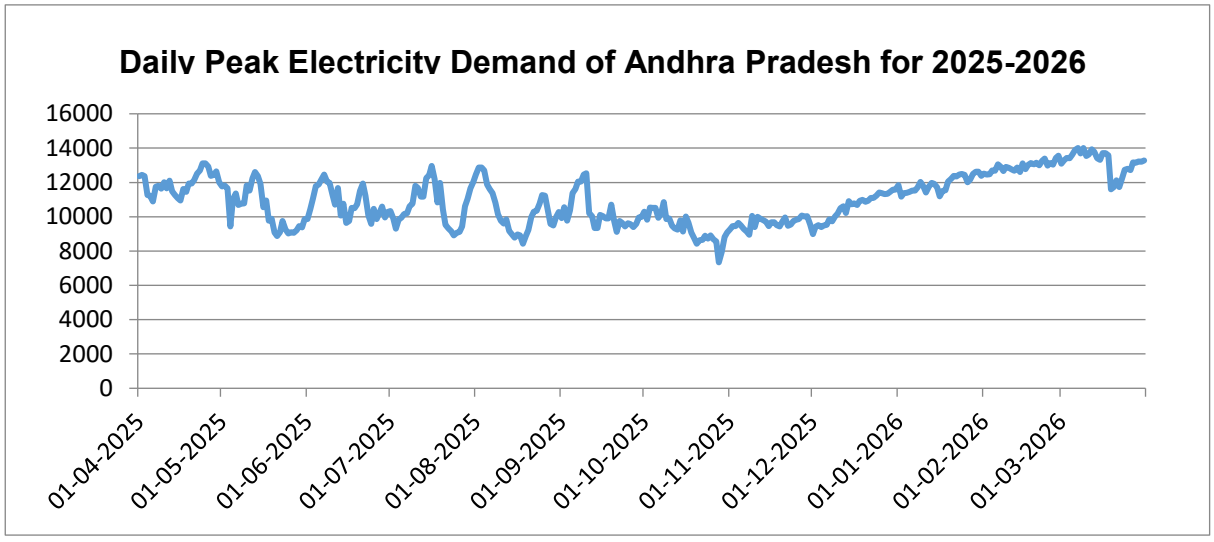

Fig 1.2: Daily peak electricity demand of Andhra Pradesh in 2025-26

It is observed that electricity demand is high in the months of Feb, March and April during day time.

Comparison of daily peak demand for day time and night time for the State is given in Fig. 1.4.

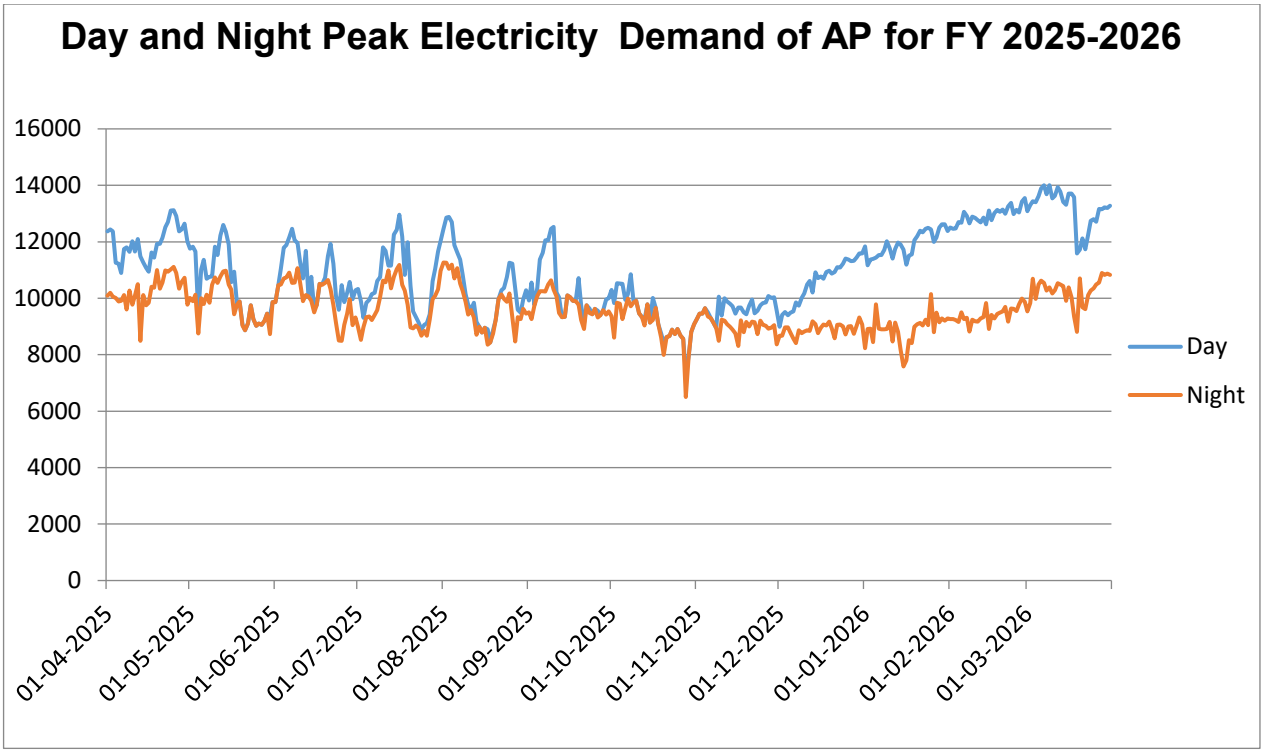

Fig. 1.3: Day and night time peak electricity demand of Andhra Pradesh

It can be observed that day peak is higher than night peak for almost all months in the year. Andhra Pradesh has taken various initiatives such as feeder segregation and shifting of agricultural load during day time to match with the peak RE generation.

1.3 Existing Transmission Network in Andhra Pradesh (as on 31.03.2026)

Andhra Pradesh has a vast transmission network that includes extensive 220 kV, 400 kV and 765 kV system in Intra-state and Inter State Transmission.

1.3.1 Intra-State Transmission System in Andhra Pradesh

Under Intra-state transmission network, the highest voltage is 400 kV. The number of sub-stations, transformation capacity and length of transmission lines at different voltage levels in intra-state transmission network are given below.

Table 1.3: Details of Intra-State Transmission System (Sub-stations) in Andhra Pradesh (as on 31st March, 2026)

S.No.	Voltage level	Existing Intra- State transmission system (Substations)

		No of S/s.	MVA
1	400/220 kV	18	20980
2	220/132 kV	116	29070
3	132/33 kV	250	25491.5
	Total	**384**	**75541.5**

Table 1.4: Existing transmission system (Transmission Lines) incl. Cable as on 31st March, 2026

S.No.	Voltage level	Length (ckm)
1	400 kV	5708
2	220 kV	13373.1
3	132 kV	14156
	Total	**33237.1**

Table 1.5: Existing intra-state sub-stations (400 kV) as on 31st March, 2026

Sl. No.	Name of Substation	Voltage Ratio (kV)	Transformation Capacity (MVA)
1.	400 kV SS Manubolu	400/220/132	1745
2.	400 kV SS Sattenapalli	400/220	1130
3.	400 kV SS Podili	400/220	945
4.	400 kV SS Kamavarapukota	400/220	630
5.	400 kV SS Maradam	400/220	1630
6.	400 kV SS Kalapaka	400/220	945
7.	400 kV SS Nannur	400/220	1130
8.	400 kV SS Chittoor	400/220	945
9.	400 kV SS Kalikiri	400/220	630
10.	400 kV SS Ghani	400/220	1500
11.	400 kV SS Rachagunneri	400/220/132	1050
12.	400 kV SS Jammalamadugu	400/220/132	1790
13.	400 kV SS Uravakonda	400/220	1630
14.	400 kV SS Talaricheruvu	400/220	945
15.	400 kV SS Hindupur	400/220	1260
16.	400 kV SS Vemagiri	400/220	1445
17.	400 kV SS Guddigudem	400/220	630
18.	400 kV GIS Thallayapalem	400/220	1000
Total			**20980**

Bus Reactors

Bus reactors are installed on the buses at the voltage levels of 400 kV. Details of the bus reactors, and MVAR capacity is included in the Table 1.5.

Table 1.6: Details of Reactors

S.No.	Sub-station	Capacity of shunt Reactor (in MVAR)
1	400kV Kalapaka	2x63+1x125
2	400kV Jammalamadugu	80
3	400kV Podili	80
4	400kV Hindupur	1x80+1x125
5	400kV SS Uravakonda	2x125
6	400kV SS Vemagiri	125
7	400kV SS Ghani	2x125
8	400kV SS Narnoor	125
9	400kV SS Talaricheruvu	125
10	400kV SS Chittoor	125
11	400kV SS Sattenapalli	125
12	400kV SS Rachagunneri	125
13	400kV SS Tallayapalem	125
	Total	**1991**

1.3.2 Inter-State Transmission system (ISTS) in Andhra Pradesh

The details of existing Inter-State transmission network in Andhra Pradesh is given in Table 1.7:

Table 1.7: Existing Inter-State Transmission system (Substations)

S.No.	Voltage level	Existing Inter- State transmission system (Substations) (as on 31.03.2026)	
		No of Substations	MVA
1	765/400 kV	7	24000
2	400/220 kV	8	13150
	Total	**15**	**37150**

Table 1.8: Existing Inter-State Transmission system (Transmission Lines)

S.No.	Voltage level	Existing Inter- State transmission system (Transmission Lines) (as on 31.03.2026)
		(ckm)
1	765 kV	5541
2	400 kV	9823
	Total	**15364**

Table 1.9: List of 765 kV Substations

Sl. No.	Name of Substation	Voltage Ratio (kV)	Transformation Capacity (MVA)
1.	Srikakulam	765/400	3000
2.	Vemagiri	765/400	3000
3.	Cuddapah	765/400	3000
4.	Kurnool	765/400	4500
5.	Chilakaluripeta	765/400	3000
6.	Kurnool-III	765/400	4500
7.	Nellore Pooling Station	765/400	3000
Total			**24000**

Table 1.10: List of 400 kV Substations

Sl. No.	Name of Substation	Voltage Ratio (kV)	Transformation Capacity (MVA)
1.	Gajuwaka	400/220	1130
2.	Nunna	400/220	1130
3.	Tallapally	400/220	1130
4.	Gooty	400/220	1130
5.	Cuddapa	400/220	1130
6.	NP Kunta	400/220	2000
7.	Nellore_PG	400	-
8.	Ananthapur	400/220	2000
9.	Kurnool-III	400/220	3500
Total			**13150**

Table 1.11: Reactors in Andhra Pradesh under ISTS

S. No.	Voltage level (kV)	Bus Reactors (Nos.)	Bus Reactors (MVAR)	Line Reactors (Nos.)	Line Reactor Capacity (MVAR)	Total (MVAR)
1	765 kV	51 (1-Phase)	4170	69 (1-Phase)	5520	9690
2	400 kV	18 (3-Phase)	1612	31 (3-Phase)	1923	3535
Total			**5782**		**7443**	**13225**

Table 1.12: FACTS devices under ISTS

Sl. No.	Substation	Voltage (kV)	Equipment	Capacity (MVAR)	Remark
1	NPKunta	400	STATCOM	2*50/-2*50	3-Φ Unit
2	Cuddapah	400	FSC-1	40%	40% reduction in line impedance
3	Cuddapah	400	FSC-2	40%	40% reduction in line impedance

The power map of Andhra Pradesh depicting all existing inter-state and intra-state substations and associated transmission lines (220 kV and above voltage level) is given at **Annexure-E**.

1.4 Constraints in Transmission System of Andhra Pradesh:

There are many transmission lines in Andhra Pradesh which are 'N-1' non-compliant in certain scenarios. There is a need to plan adequate transmission system to mitigate the existing transmission constraints. Also, several planned intra-state transmission elements are delayed, leading to the elements being 'N-1' non-compliant.

The major 'N-1' non-compliant transmission elements at present as per the information provided by Grid-India are given below:

1.4.1 Operational constraints in InSTS:

(i) Operational constraints in 400/220 kV ICTs at Intra-State substations in Andhra Pradesh:

S. No.	Substation	Major Constraints	Remedial Solution	Status	SCoD
1	400/220kV Kalapaka	N-1 non compliance of 3x315 MVA ICTs	Augmentation with 4th ICT 500MVA	Under construction	July-26
2	400/220 kV Kota	N-1 non compliance of 2x315 MVA ICTs	Augmentation with 3rd ICT 500 MVA	Under Construction	Oct-26
3	400/220 kV Vemagiri	N-1 non compliance of (3x315 + 1x500 MVA) ICTs	Commissioning of 400 kV Ainavalli S/S and its 220 kV downstream system	Under Construction	July-26
4	400/220 kV Gazuwaka	N-1 non compliance of (2x315 + 1x500 MVA)ICTs	Commissioning of 400/220kV Atchuthapuram s/s and its 220kV downstream system	Under Construction	Oct-26

(ii) Operational constraints of transmission lines in Intra-State Transmission System (220 kV transmission network):

S. No.	Major Constraints	Remedial Solution	Status	SCoD
220 kV line constraints in Vijayawada/ Vemagiri area				
1	Overloading of 220 kV Vemagiri-Duvva S/C line	● Commissioning of 400/220 kV Gudivada S/s ● LILO of Gudivada - Bhimavaram/Akiveedu lines at 400 kV Gudivada S/S	● Work under progress ● Work under progress	● 400 kV Bus charged on 26.02.2026. One 315 MVA ICT being diverted from Hindupur. SCoD: June 2026 ● August, 2026
2	Overloading of 220 kV Nunna- Gudivada D/C Line	● Commissioning of 400/220 kV Gudivada S/s ● LILO of Gudivada - Bhimavaram/Akiveedu	● Work under progress	● 400 kV Bus charged on 26.02.2026. One 315 MVA ICT

		lines at 400 kV Gudivada S/S ● Replacement of conductor on 220kV Nunna - Gudivada D/C	● Work under progress ● Completed	being diverted from Hindupur. SCoD: June 2026 ● August , 2026 ● Charged on 19.09.2025
3	Overloading of 220kV Vijaywada TPS - Kondapalli D/C Line	● Commissioning of 220kV Tiruvuru S/S ● LILO of 220kV Nunna - KTPS at 220kV Tiruvuru	● Charged on 01.04.2026 ● Charged on 04.02.2026	● Charged on 01.04.2026 ● Charged on 04.02.2026
4	Overloading of 220kV Vemagiri - BommurD/CLine	LILO OF 220KV Bommuru-Vijjeswaram-2SC line at Vemagiri.	Construction of 2 Nos bays at 400KV SS Vemagiri	Septemper 2026
5	Overlaoding of 220kV Podili_400 - Podili_AP D/C Line	LILO of 220KV Podili-Markapur/Srisailam DC line to 400/220KV SS Podili Replacement of line with HTLS conductor	Work to be taken up	December 2027 January 2027
220 kV line constraints in Vishakhapatnam area				
6	Overlaoding of 220kV Kalpakka-Brandix D/C Line	Commissioning of 400/220kV Atchuthapuram s/s and its 220kV downstream system	Under Construction	October, 2026
7	Overloading of 220kV Maradam-Bobbili D/C Line	Single LILO of 220kV Bobbili - Garividi DC line at 400/220kV Maradam S/S	Under Construction	August, 2026
8	Overloading of 220kV Lower Sileru – Bommuru S/C	Commissioning of 220kV Lower Sileru - RC Varam line	Under Construction	October 2028
220 kV line constraints in Rayalaseema area				
9	Overloading of 220kV Chinakampalli-Kadapa S/C Line	LILO of one circuit of 220kV Jammalamadugu - Poumamilla D/C at 220 kV Mydukur	Work is under progress	September, 2026

10	Overloading of 220kV Rachaguneri - Renigunta D/C line	Replacement of existing conductor with HTLS	Work to be taken up	July 2027
11	220kV Chittor-Thiruvallam S/c line is kept open due to overloading	Re-conductoring of 220kV Chitoor - Thiruvallam S/C to HTLS	After commissioning of SN Pet near 400 kV Thiruvallam (being implemented by TANTRANSCO)	
12	Overloading of 220kV Chittoor_400 - Chittoor_AP D/C line			

1.4.2 Operational constraints in ISTS:

a) Operational constraints in 765/400 kV and 400/220 kV ICTs at Inter-State substations in Andhra Pradesh:

S. No.	ICT	Major Constraints	Remedial Solution	Status	SCoD
1	400/220 kV Gazuwaka	N-1 non-compliance of (2x315 + 1x500 MVA) ICTs	4th 500 MVA ICT at Kalpaka S/s	Work is under construction.	Aug 2026
2	400/220 kV Vijayawada	N-1 non-compliance of (2x315 + 1x500 MVA)	315 MVA ICT at 400/220kV Gudiwada S/S	Work is under construction.	July 2026
3	400kV/220kV Tallapalli	N-1 non-compliance of (2x315 + 1x500 MVA)	4th ICT 1x500 MVA approved	Work to be taken up	-

b) Transmission line constraints

S. No.	Transmission line	Major Constraints	Remedial Solution	Status	SCoD
1	400kV Vemagiri_PG - Vemagiri_AP D/C lines	During high demand period of AP	Reconductoring of the line	Work to be taken up	-

2	400kV Gooty-Pavagada-D/C	During Non-solar hours	Reconductoring	Reconductoring was approved and work to be taken up.	-

Chapter-2
Transmission System Requirement by 2029-30

2.1 Load flow studies for the year 2029-30

2.1.1 Scope of Load flow studies:

System studies for the resource adequacy plan for Andhra Pradesh's InSTS have been carried out using the PSSE Software. The studies that have been carried out include the following:

(i) Steady state load flow studies

(ii) Contingency Analysis

(iii) Short Circuit Studies

2.1.2 Assumptions in the studies and Transmission Planning Guidelines

The load flow studies have been carried out for the above-mentioned scenarios following considerations:

(i) APTRANSCO's transmission network has been represented at 220 kV and above voltage levels, where loads have been considered incidental on 220 kV buses.

(ii) Load power factor has been considered within ± 0.95 as per the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019.

(iii) 'N-1' criterion has been considered for providing reliable power supply to the consumers as recommended in the Manual on Transmission Planning Criteria of CEA (2023).

(iv) Transformation capacity of any single load serving sub-station at 220 kV and 400 kV levels has been considered to be limited to 1000 MVA and 2500 MVA respectively as per the Manual on Transmission Planning Criteria of CEA (2023). Also, Transformation capacity of any single generation pooling sub-station at 220 kV and 400 kV levels has been considered to be limited to 1000 MVA and 5000 MVA respectively as per the Manual on Transmission Planning Criteria of CEA (2023).

(v) Due to RoW constraints, re-conductoring of the existing 220 kV transmission lines with higher capacity conductors like HTLS (High Temperature Low Sag), having an ampacity more than double that of Zebra conductor has been considered to increase capacity of the lines to meet the system requirement.

(vi) For the load flow studies, the transmission elements (new lines/ reconductoring of the existing lines and new substations/ ICT augmentations) already planned by APTRANSCO

to be added by 2029-30 have been considered. Similarly, the ISTS network planned to be added by 2029-30 have also been considered.

(vii) The system voltage has been considered within the following limits as per the Manual on Transmission Planning Criteria, 2023:

220 kV	Max 245 kV, Min 198 kV
400 kV	Max 420 kV, Min 380 kV
765 kV	Max 800 kV, Min 728 kV

2.1.3 Projected peak electricity demand and Likely installed Capacity by 2029-30:

(a) Electricity Demand by 2029-30:

The peak electricity demand of Andhra Pradesh from 2025-26 to 2029-30 as per revised 20th EPS projections and as estimated by the state is given in Table 2.3 and depicted in Fig. 2.2. For the load flow studies peak electricity demand of Andhra Pradesh in 2029-30 is considered as per revised 20th EPS projections i.e. 22,091 MW.

Table 2.1: Peak electricity demand of Andhra Pradesh

Sl. No.	Year	Peak electricity demand (MW) as per 20th EPS	Peak electricity demand (MW) as per APERC
1	2025-26 (Projection)	16212	15076
2	2026-27 (Projection)	17509	16271
3	2027-28 (Projection)	18870	17559
4	2028-29 (Projection)	20309	18957
5	2029-30 (Projection)	22091	20456

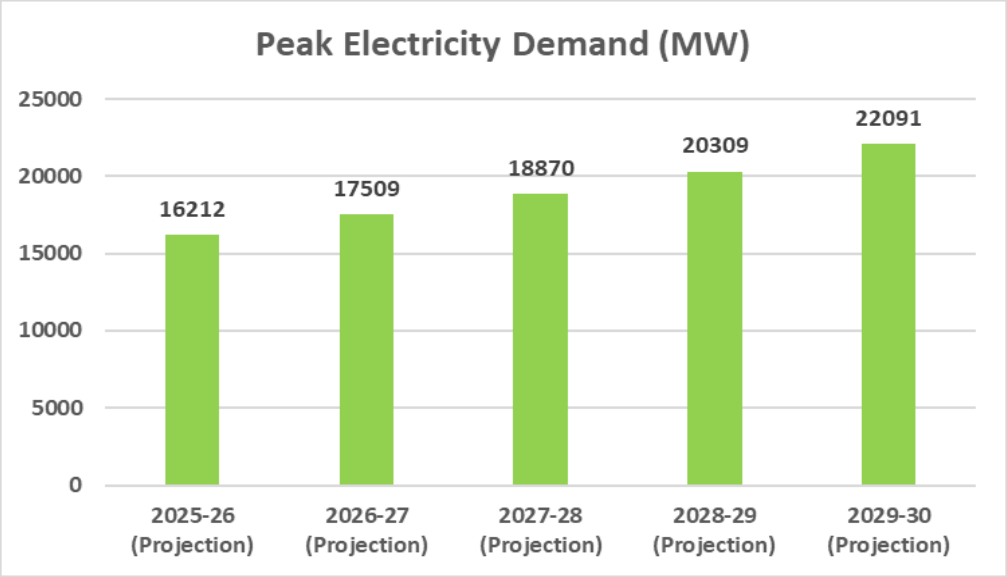

Fig. 2.1: Peak electricity demand

The total demand of state has been taken by adding the projected peak demand of each sub-station, demand at new substation and then normalizing it to the total peak demand of State as per the revised 20th EPS.

(b) Likely installed Capacity in Intra-State by 2029-30:

Andhra Pradesh is blessed with abundant renewable energy (RE) sources due to its geographical location, climate, and other factors. State receives abundant sunlight throughout the year, which makes it an ideal location for solar power generation. The state has a long coastline of 1053 km which makes it a favorable location for wind power generation. Overall, Andhra Pradesh's favorable climate and natural resources have enabled it to become one of the leading states in India in terms of renewable energy. Likely Installed Generation Capacity considered in Andhra Pradesh by 2029-30 for planning of transmission system is given in Table 2.2 and depicted in Fig. 2.2.

Table 2.2: Likely Installed Generation Capacity considered in Andhra Pradesh by 2029-30

(All figures in MW)

Coal	Gas	Hydro	Nuclear	Wind	Solar	Biomass	Small Hydro	Total (MW)	BESS
10778	216	2964	134	5470	18056	129	10	37757	1500

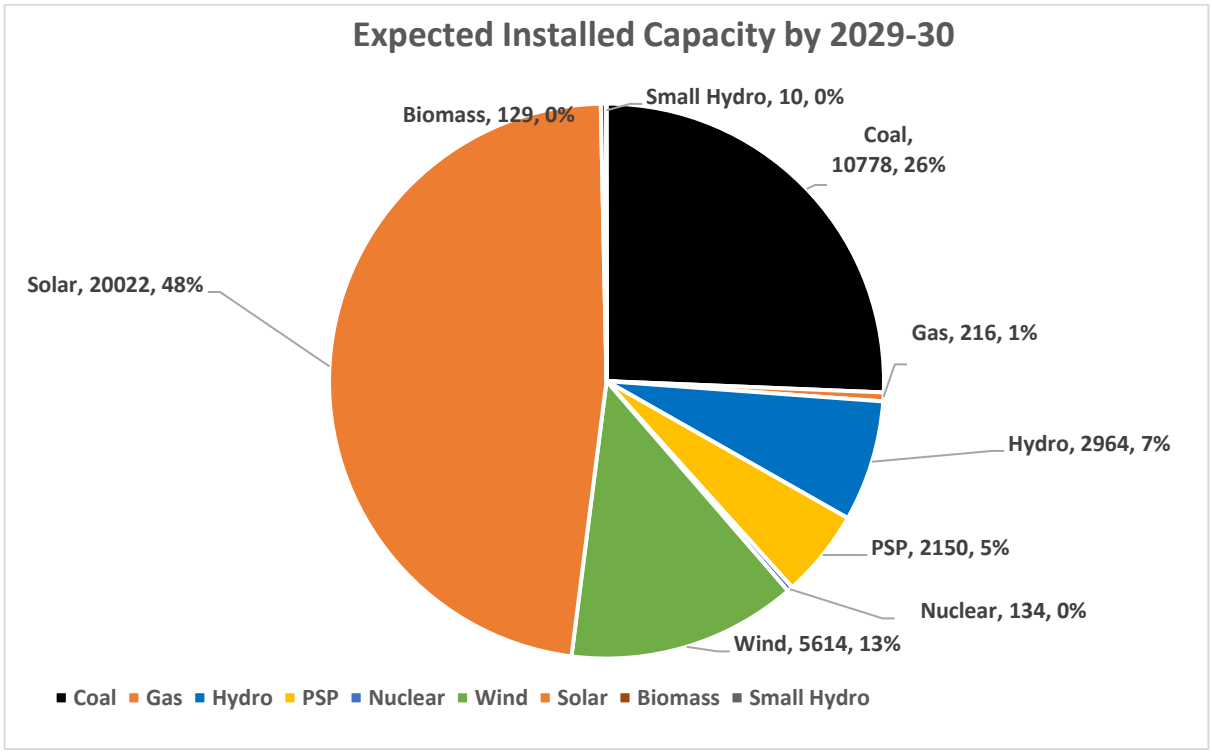

Fig. 2.2: Likely Installed Generation capacity by 2029-30 (MW)

(c) Major Generation capacity planned to be added in Intra-State by 2029-30:

S.No.	Generator name	Installed capacity (MW)	Type	Commissioning year
1	SECI	4750	Solar	2026-27
2	DRE	2074	DRE	2026-27
3	BBB	640	Wind	2027-28
4	BBB	400	Solar	2027-28
5	Polavaram Hydro electric Project	7x80=560	Hydel	2027-28
6	Lower Sileru power House	2x115=230	Hydel	2027-28
7	DRE	1524	DRE	2027-28
8	SECI	250	Solar	2027-28

9	Polavaram Hydro electric Project	5x80=400	Hydel	2028-29
10	DRE	2148	DRE	2028-29
11	SECI	2000	Solar	2029-30
12	DRE	2148	DRE	2029-30

(d) BESS capacity planned in Intra-State by 2029-30:

Likely Installed Capacity of BESS considered in Andhra Pradesh by 2029-30 for planning of transmission system is given in Table 2.2.

Table 2.3: Substation wise details of the PSP and BESS to be added under Intra-State in Andhra Pradesh by 2029-30

Sr. No.	Type of Storage	Name of GSS	BESS (MW/MWh)	Commissioning year
1	Battery storage	400 kV GSS Jammalamadugu	225MW/ 450MWh	2026-27
2	Battery storage	400 kV GSS Ghani	225MW/ 450MWh	2026-27
3	Battery storage	220 kV Kuppam	50MW/100MWh	2026-27
4	Battery storage	400 kV GSS Talari Cheruvu	275MW/ 550MWh	2027-28
5	Battery storage	400 kV GSS Hindupur	225MW/ 450MWh	2027-29
6	Battery storage	220 kV GSS Pampanurtanda	225MW/ 450MWh	2027-28
7	Battery storage	400 kV SS Maradam	75MW/ 150MWh	2027-28
8	Battery storage	220 kV SS Gajuwaka	25MW/ 50MWh	2027-28
9	Battery storage	220 kV SS Simhachalam	25MW/ 50MWh	2027-28
10	Battery storage	400 kV SS Kalikiri	150 MW/300 MWh	2027-28
Total			**1500 MW/ 3000 MWh**	

2.1.4 Intra-state LGBR for Load flow studies for the year 2029-30:

As the huge quantum of RE (solar and wind) is envisaged to be integrated under Intra-State, LGBR has been prepared for the peak electricity demand scenario (in Andhra Pradesh) which occurs during summer season in the month of March/ April. Also, July-august Monsoon season afternoon scenario (high wind generation) has been studied.

Table 2.4: Intra-state LGBR in Andhra Pradesh

Source	Installed capacity as on 31.03.2026 (GW)#	Capacity addition during 2026-2030 (GW)	Total capacity by 2030 (GW)	% dispatch in winter	LGB in Winter (Jan-Feb) season (GW)	% dispatch in Monsoon	LGB in Monsoon (Jul-Aug) season (GW)
Thermal	10.778	0	10.778	0.6	6.467	0.45	4.850
Nuclear	0.134	0	0.134	0.8	0.107	0.8	0.107
Hydro	1.774	1.19	2.964	0.25	0.741	0.7	2.075
Wind	3.9	1.57	5.47	0.1	0.547	0.5	2.735
Solar	3.96	8.4	12.3	1	12.31	0.7	8.617
Solar Generation under Kusum scheme+FLS+rooftop					**5.746**		**5.746**
Total Generation (GW)					**25.918**		**24.130**
Peak demand as per EPS (GW)					**22.091**		**20.091**
Surplus (Without BESS, PSP and additional load)					**3.827**		**4.039**
PSP					0		0
BESS					1.5		1.5
Additional load					0		0

Total of BESS +PSP+additional load	**1.5**		**1.5**
Net Surplus (With BESS, PSP, and additional load)	**2.327**	**0**	**2.539**

 # including allocated shares in Joint and Central Sector utilities

From above table, it can be observed that surplus generation of 3.8 GW is expected even during the March solar peak scenario due to Solar and DRE addition when the generation from hydro and wind remains low whereas electricity demand is high. Quantum of surplus generation in other seasons would be even higher during in solar hours (4.04 GW in Monsoon season) which can offset with PSP, BESS and additional loads.

2.2 Transmission schemes to be added under Intra-State by 2029-30

Summart of Transmission schemes to be added under Intra-State by 2029-30 is given below (Details given at **Annexure-A**):

Table 2.5: Transformation capacity (MVA) to be added under Intra-state by 2029-30

Transformation Capacity (MVA)					
S.No.	**Voltage level**	**Under Construction**	**Planned**	**Under Planning**	**Total**
1	400/220 kV	1130	3500	1500	6130
2	220/132 & 220/33 kV	1800	5520	8400	15720
	Total	**2930**	**9020**	**9900**	**21850**

Table 2.6: Transmission lines (ckm) to be added under Intra-state by 2029-30

Transmission Lines (ckm)					
S.No.	**Voltage level**	**Under Construction**	**Planned**	**Under Planning**	**Total**
1	400 kV	368	613	637	1618
2	220 kV	208.4	967.4	425	1600.8
	Total	**576.4**	**1580.4**	**1062**	**3218.8**

Table 2.7: No of substations to be added to be added by 2029-30

Voltage level	No of substations
400 kV	8
220 kV	27
Total	**35**

Table 2.8: Details of reconductoring planned by 2029-30

Voltage level (kV)	Under Construction		Planned		Total	
	No of lines	ckm	No of lines	ckm	No of lines	ckm
400				32		**32**
220				461		**461**
Total	**0**	**0**	**0**	**493**	**0**	**493**

Table 2.9: Bus reactors planned under intra-state by 2029-30

Voltage level (kV)	Under Construction		Planned		Under Planning		Total	
	No of reactor	MVAR	No of reactor	MVAR	No of reactor	MVAR	No of reactor	MVAR
400	0	0	3	375	0	0	**3**	**375**
Total	**0**	**0**	**3**	**375**	**0**	**0**	**3**	**375**

Major transmission schemes and substations planned under intra-state to be added during 2026-30 are given below:

(i) 400KV Twin HTLS DC line from 400KV Talaricheruvu to Proposed Kamalapadu 400KV SWS (25Km) for 950MW PSP Kamalapadu

(ii) 400KV QMDC line from 400KV Kakinada SEZ to 400KV SWS Upper Sileru (160Km) for 1350MW PSP Upper Sileru:

(iii) 400kV TMDC (HTLS) line from 400/220kV Talaricheruvu to 400/220kV SS Podili(230km)

(iv) 400KV Twin HTLS DC line from 400KV Podili to 400KV Ramayapatnam (96KM)

(v) 400kV TMDC (HTLS) line from 400/220kV SS Jammalamadugu to 400/220kV SS Ramayapatnam(210km)

(vi) Establishing 400/220 kV SS Ramakuppam

(vii) 400 kV QMDC line from Ramakuppam to Proposed 765/400KV SS Malur

(viii) Construction of 400/132KV GIS SS/Ainavilli 2*315MVA

(ix) LILO of 400 KV Vemagiri – Konaseema line at 400/132 KV Ainavilli SS.
(x) Construction of 400/220kV GIS Atchutapuram,2*500,1*125MVAr Reactor
(xi) Double LILo 1Km LILO of 400kV Kalapaka, Khammam Line & Kalapaka – Asupaka TMDC
(xii) Construction of 400/220 kV KAKINADA 2*500MVA,1*125MVAr Reactor
(xiii) LILO of existing 400kV HNPCL - Kamavarapukota TMDC line to 400/220/132/33kV Kakinada SEZ SS.
(xiv) Construction of Gudivada with 2×500 MVA, 400/220 kV ICTs
(xv) Construction of Palasa with 2×500 MVA, 400/220 kV ICTs
(xvi) Construction of Karedu with 3X500 MVA 400/220KV ICTs

2.3 Transmission schemes to be added under Inter-State by 2029-30

Summary of the transmission schemes to be added under Inter-State by 2029-30 is given below (Details given at **Annexure-B)**

Table 2.10: Transformation Capacity (MVA) to be added under inter-state by 2029-30

S.No.	Voltage level	Under Construction	Under Planning	Total
1	765/400 kV	66,000	-	66,000
2	400/220 kV	25,000	500	25,500
	Total	**91,000**	**500**	**91,500**

Table 2.11: Transmission lines (ckm) to be added under inter-state by 2029-30

S. No.	Voltage level	Under Construction	Under Planning	Total
1	765 kV	6,012	-	6,012
2	400 kV	900	-	900
	Total	**6,912**	**-**	**6,912**

Table 2.12: Bus Reactors planned under inter-state by 2029-30

	Under Construction	Under Planning	Total

Voltage level (kV)	No of reactor	MVAR	Total MVAR	No of reactor	MVAR	No of reactor	MVAR
765	18	330	5,940	-	-	18x330	5,940
	1	240	240	-	-	1x240	240
400	2	125	250	-	-	2x125	250
Total	**21**	-	**6,430**	**-**	**-**	**-**	**6,430**

Table 2.13: Line Reactors planned under inter-state by 2029-30

Voltage level (kV)	Under Construction			Under Planning		Total	
	No of reactor	MVAR	Total MVAR	No of reactor	MVAR	No of reactor	MVAR
765	24	240	5,760	-	-	24x240	5,760
	14	330	4,620	-	-	14x330	4,620
400	2	80	160	-	-	2x80	160
Total	**40**	-	**10,540**	**-**	**-**	**-**	**10,540**

Major transmission schemes and substations planned under Inter-state to be added by 2029-30 are given below:

1. Transmission System for Integration of Kurnool-IV REZ – Phase-I (for 4.5 GW)
   (i) Establishment of 4x1500 MVA, 765/400 kV & 4x500 MVA, 400/220 kV Kurnool-IV Pooling Station near Kurnool, Andhra Pradesh along with 2x330 MVAr (765 kV) bus reactors at Kurnool-IV PS
   (ii) Kurnool-IV – Bidar 765 kV D/c line (about 330 kms) with 330 MVAR SLR (convertible) at both ends on both circuits
   (iii) Kurnool-IV – Kurnool-III PS 765 kV D/c line (about 150 kms) with 240 MVAR SLR (convertible) at Kurnool-IV end on both circuits
   (iv) 300 MVAr STATCOM at Kurnool-IV PS along with 2x125 MVAr MSR
   (v) Augmentation by 1x1500 MVA, 765/400 kV ICT (3rd) at C'Peta
   (vi) LILO of Vijayawada-Nellore 400 kV D/C line at C'Peta

2. Transmission System for Kurnool-IV REZ - Phase-II (3 GW)
   (i) Augmentation of Kurnool-IV PS by 400/220 kV, 4x500 MVA ICTs
   (ii) 220 kV line bays at Kurnool-IV PS for termination of dedicated transmission lines of RE generation projects

(iii) 400 kV line bay at Kurnool-IV PS for termination of dedicated transmission lines of RE generation projects
(iv) Augmentation of Kurnool-IV PS by 765/400 kV, 2x1500 MVA and 400/220 kV, 6x500 MVA ICTs
(v) 220 kV line bays at Kurnool-IV PS for termination of dedicated transmission lines of RE generation projects
(vi) 400 kV line bay at Kurnool-IV PS for termination of dedicated transmission lines of RE generation projects
(vii) Establishment of 4x1500 MVA, 765/400 kV Doma Station with 2x330 MVAr (765 kV) bus reactors with space provision for establishment of 220 kV switchyard
(viii) LILO of Kurnool-IV – Bidar 765 kV D/c line at Doma
(ix) Doma – Shadnagar GIS S/s (TGTRANSCO) 400 kV Twin HTLS D/C line {TGTRANSCO to upgrade Shadnagar GIS (TGTRANSCO) S/s to 400 kV in matching time frame}
(x) Doma – Kethiredipally (TGTRANSCO) 400 kV Twin HTLS D/C lin

3. Transmission System for integration of Krishnagiri REZ Phase-I:
(i) Establishment of 4x1500 MVA, 765/400 kV and 5x500 MVA, 400/220kV Krishnagiri Pooling Station near Kodumur in Kurnool district along with 2x330 MVAr (765 kV) bus reactors at Krishnagiri PS
(ii) ± 300 MVAr STATCOM at Krishnagiri PS
(iii) Krishnagiri– Doma 765 kV D/c line (about 240 km) with 240 MVAr SLR (convertible) at both ends on both circuits
(iv) Krishnagiri – Raichur New 765 kV D/c line (about 150 km) with 240 MVAr SLR (convertible) at Raichur New end on both circuits
(v) Establishment of 3x1500 MVA, 765/400 kV Sagar substation with 2x330 MVAr (765 kV) bus reactors
(vi) Krishnagiri – Sagar 765 kV D/c line (about 240 km) with 240 MVAr SLR (convertible) at both ends on both circuits
(vii) Sagar – Nagarjunasagar 400 kV quad D/c line

4. Transmission System for integration of Ananthpuram-III PS REZ Phase-I
(i) Establishment of 3x1500 MVA, 765/400 kV and 7x500 MVA, 400/220kV Ananthapuram-III Pooling Station near Urvakonda / Beluguppa / Kalyandurg areas in Anantapur district along with 2x330 MVAr (765 kV) bus reactors at Ananthapuram-III PS
(ii) + 300 MVAr STATCOM at Ananthapuram-III PS
(iii) Ananthapuram-III – Krishnagiri 765 kV D/c line with 240 MVAr SLR (convertible) at Ananthapuram-III end on both circuits
5. Transmission System for Integration of Ananthapur-II REZ - Phase-I
(i) Establishment of 4x1500 MVA, 765/400 & 6x500 MVA, 400/220 kV Ananthapuram-II Pooling Station near Kurnool, Andhra Pradesh along with 2x330 MVAr (765 kV) bus reactors at Ananthapuram-II PS
(ii) Ananthapuram-II – Davangere 765 kV D/c line (about 150km) with 240 MVAR SLR (convertible) at Ananthapuram-II end on both circuits

(iii) Ananthapuram-II – Cuddapah 765 kV D/c line (about 200km) with 330 MVAR SLR (convertible) at Ananthapuram-II end on both circuits
(iv) +300 MVAR STATCOM at Ananthapuram-II PS along with 2x125 MVAr MSR

6. Transmission System for Integration of Ananthapuram-II REZ - Phase-II
   (i) Augmentation of Ananthapuram-II PS by 400/220 kV, 1x500 MVA ICT
   (ii) 220 kV line bays at Ananthapuram-II PS for termination of dedicated transmission lines of RE generation projects
   (iii) 400 kV line bays at Ananthapuram-II PS for termination of dedicated transmission line of RE generation projects
   (iv) Augmentation of Ananthapuram-II PS by 765/400 kV, 2x1500 MVA and 400/220 kV, 6x500 MVA ICTs
   (v) 220 kV line bays at Ananthapuram-II PS for termination of dedicated transmission lines of RE generation projects
   (vi) Establishment of 3x1500 MVA, 765/400 kV CN'Halli Station with 2x330 MVAr (765 kV) bus reactors
   (vii) Ananthapuram-II PS – CN'Halli 765 kV D/c line (about 180 km) with 330 MVAr SLR at Ananthapuram-II end on both circuits
   (viii) LILO of one circuit of Talaguppa - Neelmangala 400 kV D/c line at CN'Halli
   (ix) LILO at CN'Halli of already LILOed section of one circuit of Talaguppa - Neelmangala 400 kV line at Hassan

7. Inter-Regional Strengthening between SR Grid and ER Grid
   (i) Angul – Srikakulam 765 kV 2nd D/c line with 240 MVAR SLR at both ends on both circuits
   (ii) 1x330 MVAR, 765 kV bus reactor (3rd) at Angul Substation

8. Transmission system for proposed Green Hydrogen / Green Ammonia projects in Kakinada area, Andhra Pradesh (Phase-I)
   (i) Establishment of Kakinada 765/400 kV, 3x1500 MVA substation (GIS) alongwith 240 MVAr bus reactor
   (ii) LILO of Vemagiri – Srikakulam 765 kV D/c line at Kakinada substation {with 240 MVAr SLR at Kakinada GH end on Srikakulam – Kakinada section}
   (iii) ±300 MVAr STATCOM with 2x125 MVAr MSC at Kakinada 765/400 kV GIS S/s with control switching arrangement for proposed 1x240 MVAr bus reactor
   (iv) Space provision for 2nd+ 300 MVAr STATCOM with 2x125 MVAr MSC at Kakinada 765/400 kV S/s

9. Transmission system for proposed Green Hydrogen / Green Ammonia projects in Vizag area, Andhra Pradesh (Phase-I)
   (i) Establishment of 4x1500 MVA, 765/400 kV Pendurthi (Vizag) GIS substation with 1x330 MVAr (765 kV) bus reactor
   (ii) ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS with control switching arrangement for proposed 1x330 MVAr bus reactor
   (iii) Space provision for 2nd ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS

(iv) Pendurthi (Vizag) – Srikakulam 765 kV D/c line (about 200 km) with 330 MVAr SLR (convertible) at Srikakulam end on both circuits
(v) LILO of Kalpakka – Maradam 400 kV (quad) D/c line at Pendurthi (about 20 km)
(vi) Establishment of 3x1500 MVA, 765/400 kV Khammam-II substation with 1x330 MVAr (765 kV) bus reactor
(vii) Khammam-II – Warangal New 765 kV D/c line (about 100 km)
(viii) Khammam-II – Pendurthi (Vizag) 765 kV D/c line (about 350 km) with 330 MVAr SLR (convertible) at both ends on both circuits
(ix) Khammam-II – Khammam (existing) 400 kV (quad) D/c line (about 20 km)

2.4 Short Circuit Studies:

As per the short circuit studies, fault level at various substations in Andhra Pradesh are either near or higher than the designed limits. List of substations with higher fault level is given below:

Table 2.14: List of Intra-State substations with higher fault level

Substation	Voltage Level (kV)	Fault Level (kA)
400 kV Kurnool	400	74
400 kV Vijayawada AP	400	52
400 kV Vizag Pool	400	51
400 kV Vemagiri	400	46
400 kV GMR Vemagiri	400	43
400 kV Hinduja	400	43

Table 2.15: List of ISTS substations with higher fault level

Substation	Voltage Level (kV)	Fault Level (kA)
765 KV Kurnool-III	765	53
765 KV Cuddapah	765	47
765 KV Kurnool-New	765	66
400 KV Kurnool-New	400	83
400 KV Kurnool-III	400	80
400 KV Nagarjunasagar	400	56
400 KV Simhadri	400	50
400 KV Simhadri-II	400	49
400 KV Gajuwaka SR	400	48
400 KV C'Peta	400	56

Considering the high fault levels, it is recommended to implement remedial measures such as bus splitting and implementation of series reactors. As a long-term solution, it is recommended to replace the existing equipment with the higher rating equipment. It is also recommended that all new substations should be planned with higher short circuit capacity, i.e. 80 kA for 400 kV and 63

kA for 220 kV as per the CEA Manual on Transmission Planning Criteria, 2023 which is given below:

"*The maximum short-circuit level on any new substation bus should not exceed 80% of the rated short circuit capacity of the substation equipment. The 20% margin is intended to take care of the increase in short-circuit levels as the system grows. The rated breaking current capability of switchgear at different voltage levels may be taken as given below:*

Voltage Level	Rated Breaking Capacity
765 kV	50 kA / 63 kA
400 kV	63 kA / 80 kA
220 kV	40 kA / 50 kA / 63 kA
132 kV	25 kA / 31.5 kA / 40 kA
66 kV	31.5 kA

Chapter-3

Transmission System Requirement by 2034-35

The transmission system requirement during the period 2030-2035 has been worked out broadly based on the projected demand and generation capacity addition. Transmission system for evacuation of power from the RE potential zones has been planned considering planned pumped storage plants. Huge Green Hydrogen/Green Ammonia loads and Data Center loads are coming up in the State. Accordingly, the Resource Adequacy study for transmission system in the State may be reviewed in the coming months.

3.1 Load flow studies for the year 2034-35

a) Electricity demand by 2035:

Table 3.1: Peak electricity demand of Andhra Pradesh

Sl. No.	Year	Peak electricity demand (MW) as per 20th EPS	Peak electricity demand (MW) as per APERC
1	2030-31 (Projection)	27712	22092
2	2031-32 (Projection)	32025	23858
3	2032-33 (Projection)	35346	25777
4	2033-34 (Projection)	38800	27865
5	2034-35 (Projection)	42136	29720

For load flow studies, 29.7 GW demand as per APERC demand projection, has been considered.

b) Likely installed Capacity in Intra-State by 2034-35:

Likely Installed Generation Capacity considered in Andhra Pradesh by 2034-35 for planning of transmission system is given in Table 3.2.

Table 3.2: Likely Installed Generation Capacity considered in Andhra Pradesh by 2034-35

(All figures in MW)

Coal	Hydro	Nuclear	Wind	Solar	Biomass	Small Hydro	Total (MW)	PSP	BESS
12298	2964	628	8015	42400	171	106	66,582	2300	16000

c) Generation addition under Intra-State during 2030-2035:

Table 3.3: Generation addition under intra-state during 2030-2035

S.No.	Type	Capacity (GW)
1.	Thermal	4*0.8=3.2
2.	Wind	2.4
3.	Solar (Grid-connected)	19.8
4.	Solar (Kusum scheme/ Roof Top etc.)	2.4
5.	PSP	2.3
6.	BESS	16

d) Proposed generation and PSP scheduled to be commissioned 2030-35

Sl No	Name of the Pooling Station	Type of Generation	Capacity (MW)
1	400 kV Mudigubba	Solar	8000
2	400 kV Talupula	Solar	8000
3	400 kV Porumamilla	Solar	4000
	Total		**20000**
1	Kamlapadu	PSP	950
2	Upper Sileru	PSP	1350
	Total		**2300**

Table 3.4: Substation wise details of the BESS planned to be added under Intra-State in Andhra Pradesh during 2030-35

Sr. No.	Name of GSS	BESS (MW)	Status
1	400 kV Mudigubba	6000	Planned
2	400 kV Talupula	6000	Planned
3	400 kV Porumamilla	4000	Planned
Total		**16000**	

3.2 Transmission system planned to be added under Intra-State during 2030-35:

Transmission system planned to be added under Intra-State during 2030-35 are given below (Details given at **Annexure-C**):

Table 3.5: Transformation capacity (MVA) to be added under intra-state during 2030-35

S.No.	Voltage level	Planned	Under Planning	Total
1	400/220 kV	9500	7500	17000
2	220/132 & 220/33 kV	-	3200	3200
	Total	9500	10700	20200

Table 3.6: Transmission lines (ckm) to be added under intra-state during 2030-35

S.No.	Voltage level	Planned	Under Planning	Total
1	400 kV	5300	360	5660
2	220 kV	3160	1420	4580
	Total	**8460**	**1780**	**10240**

Table 3.7: No of substations to be added to be added during 2030-35

Voltage level	No of substations
400 kV	10
220 kV	11
Total	**21**

Table 3.8: Bus reactors planned under intra-state during 2030-35

Voltage level (kV)	Under Planning	
	No of reactor	MVAR

400	8	1000
Total	**8**	**1000**

Major transmission schemes and substations planned to be added during 2030-35 are given below:

(i) 400/220 kV, 5x500 MVA Mudigubba PS
(ii) 220 kV ACSR Moose Line on MC Towers from PS-1 to 400/220kV PS Mudigubba(40km)
(iii) 220kV ACSR Moose Line on MC Towers from PS-2 to 400/220kV PS Mudigubba(55km)
(iv) 400kV Twin ACSR Moose MC line from PS-3 to 400/220kV PS Mudigubba(80km)
(v) 400kV TMMC (HTLS) line from400/220kV PS Mudigubba to 400/220 kV SS Podili (240km)
(vi) 400KV Twin HTLS DC line from 400KV Talaricheruvu – 400/220KV PS Mudigubba (by utilising portion of existing 400KV Talaricheru- Jammalamadugu 400KV line break point)(90km)
(vii) 400/220 kV, 5x500 MVA Talupula PS
(viii) 220KV ACSR Moose MC line from Pooling Station- 4 to 400/220KV PS Talupula (50KM).
(ix) 220KV ACSR Moose MC line from Pooling Station- 5 to 400/220KV PS Talupula (80KM).
(x) 400KV Twin ACSR Moose MC line from Pooling Station-6 to 400/220KV PS Talupula (55KM)
(xi) 400KV Twin HTLS MC line from 400/220KV Talupula PS to 400/220KV SS Ramayapatnam. (230km)
(xii) 400KV Twin HTLS MC line from 400KV Gudivada (LILO point of 400KV Vemagiri- Sattenapalli DC line near Hanuman Junction) to 400/220KV SS at Kakinada SEZ(190KM)
(xiii) 400KV Twin HTLS DC line from 400KV Jammalamadugu –400/220KV PS Talupula (by utilising portion of existing 400KV Talaricheruvu- Jammalamadugu 400KV line break point)(90km)
(xiv) 400kV/220kV, 3x500 MVA, Ramayapatnam SS
(xv) 400KV Twin HTLS MC line from 400/220KV SS Ramayapatnam to 400KV Gudivada (220KM).
(xvi) 400/220 kV, 3x500 MVA Porumamilla PS
(xvii) 400 kV Twin HTLS (Moose) Line on Multi Circuit Towers for Double LILO of 400 kV Twin HTLS MC Line from 400KV Talapula PS to 400/220 kV Ramayapatnam SS to 400/220 kV Porumamilla PS
(xviii) 220 kV ACSR Moose MC Line from PS-7 to 400/220KV PS Porumamilla (50)
(xix) 400/220 kV, 3x500 MVA Koppaka SS
(xx) 400 kV Twin HTLS MC line from 400KV Podili – Koppaka
(xxi) 400 kV Twin HTLS MC line from 400KV Koppaka - K V Kota

(xxii) 400 kV Twin Moose MC line for Double LILO of 400 kV Acthyutapuram-Asupaka/Khammam DC line at Kamavarapukota (35 km).

3.3 Transmission schemes to be added under Inter-State during 2030-35:

Summary of the transmission schemes to be added under Inter-State during 2030-35 is given below **(**Details given in **Annexure-D)**

Table 3.9: Transformation Capacity (MVA) to be added under inter-state during 2030-35

S.No.	Voltage level	Under Planning
1	765/400 kV	36,000
2	400/220 kV	13,000
	Total	**49,000**

Table 3.10: Transmission lines (ckm) to be added under inter-state during 2030-35

S. No.	Voltage level	Under Planning
1	765 kV	4,958
2	400 kV	330
	Total	**5,288**

Table 3.11: Bus Reactors planned under inter-state during 2030-35

Voltage level (kV)	Under Planning		
	No of reactor	MVAR	Total MVAR
765	3	330	990
	1	240	240
Total	**4**	**-**	**1,230**

Table 3.12: Line Reactors planned under inter-state during 2030-35

Voltage level (kV)	Under Construction		Under Planning			Total	
	No of reactor	MVAR	No of reactor	MVAR	Total MVAR	No of reactor	MVAR
765	-	-	10	330	3,300	**10x330**	**3,300**
	-	-	20	240	4,800	**20x240**	**4,800**
Total	-	-	**30**	-	**8,100**	**-**	**8,100**

Major transmission schemes and substations planned to be added during 2030-35 are given below:

1. **Transmission System for integration of Kadapa-II REZ**
   - i) Establishment of 4x1500 MVA, 765/400 kV and 5x500 MVA, 400/220kV Kadapa-II Pooling Station along with 2x330 MVAr bus reactor
   - ii) ± 300 MVAr STATCOM at Kadapa-II
   - iii) Kadapa-II – Thiruvelam 765kV D/c line (250 km) 1x240 MVAr SLR (convertible) at both ends on both circuits
   - iv) Ananthapuram-III – Kadapa-II 765kV D/c line (220 km) with 1x330 MVAr SLR (convertible) at Ananthapuram-III end on both circuits
   - v) Augmentation of 2x1500 MVA, 765/400 kV and 5x500 MVA, 400/220kV Kadapa-II Pooling Station
   - vi) Upgradation of Nagapattinam GIS to 765 kV level with 2x1500 MVA, 765/400kV ICTs
   - vii) Thiruvelam – Nagapattinam 765kV D/c line (250 km) 1x240 MVAr SLR (convertible) at both ends on both circuits

2. **Transmission System for integration of Krishnagiri REZ - Phase-II**
   - i) Augmentation of 2x1500 MVA, 765/400 kV and 9x500 MVA, 400/220kV ICTs at Krishnagiri PS
   - ii) Krishnagiri – Nellore 765 kV D/c line 1x240 MVAr SLR (convertible) at both ends on both circuits
   - iii) Khammam-II – Sagar 765 kV D/c line 1x240 MVAr SLR (convertible) at Khammam-II end on both circuits

3. **Transmission System for Integration of Ananthapuram-III REZ Phase-II**
   i) Augmentation of 3x1500 MVA, 765/400 kV and 7x500 MVA, 400/220kV ICTs at Ananthapuram-III PS
   ii) Establishment of 2x1500 MVA, 765/400 kV GIS substation near Malur with 1x240 MVAr (765 kV) bus reactor with space provision for establishment of 220 kV switchyard at Malur
   iii) Ananthapuram-III – Malur 765kV D/c line with 240 MVAr SLR (convertible) at both ends on both circuits
   iv) ± 300 MVAr STATCOM at Malur
   v) Malur – Somanahalli 400 kV (Quad) D/c line
   vi) Malur – Hosur 400 kV (Quad) D/c line
4. **Transmission system for proposed Green Hydrogen / Green Ammonia projects in Vizag area, Andhra Pradesh Phase-II (for GH loads at Kakinada & Pendurthi)**
   i) Augmentation of 2x1500 MVA, 765/400 kV ICTs at Pendurthi (Vizag)
   ii) Augmentation of 3x1500MVA, 765/400 kV ICTs at Kakinada GH
   iii) Sagar – Kakinada 765 kV D/c line with 1x330 MVAr SLR on both circuits on both ends
   iv) Pendurthi – Kakinada GH 765 kV D/c line with 1x240 MVAr SLR at Pendurthi end on both circuits
5. **Transmission system for proposed Green Hydrogen / Green Ammonia projects in Ramayapatnam area (Phase-I)**
   i) Establishment of 3x1500 MVA, 765/400 kV Ramayapatnam substation with 1x330 MVAr bus reactor and space provision for establishment of 400/220 kV switchyard
   ii) ±300 MVAr STATCOM at Ramayapatnam and space provision for additional 2nd STATCOM
   iii) Ramayapatnam – Kadapa-II 765 kV D/c line with 1x330 MVAr SLR at Kadapa-II end on both circuits
   iv) Ramayapatnam – Sagar 765 kV D/c line with 1x330 MVAr SLR at Ramayapatnam end on both circuits
6. **Transmission system for proposed Green Hydrogen / Green Ammonia projects in Ramayapatnam area (Phase-II)**
   i) Augmentation of 2x1500 MVA, 765/400 kV ICTs at Ramayapatnam
   ii) LILO of Krishnagiri – Nellore PS 765 kV D/c line at Ramayapatnam

Chapter-4

Transmission Plan for Integration of Renewable Energy Generation Projects in Andhra Pradesh

4.1 Introduction:

Andhra Pradesh is blessed with renewable energy (RE) sources due to its geographical location, climate and other natural factors. State receives abundant sunlight throughout the year, which makes it an ideal location for solar power generation.

As on March, 2026, around 16 GW Renewable Energy capacity (including large Hydro) has been installed in Andhra Pradesh. Share of Renewable energy in the total power capacity in the State is 52.74%. Transmission system for integration of around 62 GW of RE (Solar) capacity has been planned to be integrated by 2034-35 which are under various stages of implementation.

4.2 Status of transmission system under Intra-State in Andhra Pradesh

Table 4.1: Transmission system under intra-state for RE (including schemes under GEC) in Andhra Pradesh

District	**Ananthapur district**			**Kurnool district**		**Kadapa district**		**Other Districts**	**Total**
Solar	-	Talupula	Mudigubba	-	-	-	Porumamilla	-	-
Commissioned	0.74	-	-	1.29	-	1.23	-	0.7	**3.96**
Under implementation	0.4	-	-	-	-	-	-	0.1	**0.5**
Planned	0.65	6	6	0.04	-	0.16	4	-	**16.85**
Total (Solar)	**1.79**	**6**	**6**	**1.33**	**0**	**1.39**	**4**	**0.8**	**21.31**
Wind									
Commissioned	2.7	-	-	0.65	-	0.55	-	-	**3.9**
Under implementation	0.64	-	-	0	-	0.05	-	0	**0.69**
Planned	0.3	-	-	0.08	-	0.5	-	0	**0.88**
Total (Wind)	**3.64**	**0**	**0**	**0.73**	**0**	**1.1**	**0**	**0**	**5.47**
Grand Total (Solar+Wind)	**5.43**	**6**	**6**	**2.06**	**0**	**2.49**	**4**	**0.8**	**26.78**

4.3 Transmissions System planned under Green Energy Corridor (GEC) Scheme:

Status of Intra-State transmissions schemes planned under Green Energy Corridor (GEC) scheme is as given below:

Table 4.2: Intra-state transmission system planned under GEC

Scheme	RE (GW)	ckm	MVA	Status
GEC-I	3.15	888	1968	Commissioned
GEC-III	11	7,872	9,500	Planned

4.3.1 Transmission System planned under Green Energy Corridor Phase-III (GEC-III) scheme:

Major transmission system for evacuation of renewable energy has been planned under Green Energy Corridor Phase-III (GEC-III) scheme. APTRANSCO submitted proposals under GEC-III scheme to strengthen the state's transmission infrastructure for efficient renewable energy evacuation. Accordingly, a joint study meeting was convened with the CEA, SRPC, CTUIL, SRLDC and APTRANSCO to review and finalize the proposed schemes.

APTRANSCO proposed transmission schemes for the evacuation of 18,370 MW of RE power; which includes 11,000 MW from solar and 7,370 MW from Pumped Storage Projects (PSP), as listed in table below:

S. No.	Name of the Solar Power Plant	Capacity (MW)
1	Mudigubba Pooling Station	5000
2	Talupula Pooling Station	5000
3	Porumamilla Pooling Station	1000
	Total Solar Generation	**11000**
S. No.	**Name of the Pumped Storage Project**	**Capacity (MW)**
1	Aravetipalli	1320
2	Gadikota	1200
3	Kamalapadu	950
4	Yaganti	1000
5	Deenepalli	750
6	Rajupalem	800
7	Upper Sileru	1350
	Total PSP Load	**7370**

The details of the RE generation, for which transmission is proposed under GEC-III scheme, is as follows:

S. No.	RE Generation anticipated in Andhra Pradesh		Timelines
	Location	Quantum	
1	Roddam	3000 MW	28.02.2029
2	Nallamada	3000 MW	31.05.2030
3	Amaduguru	1000 MW	30.11.2030
4	Gorantla	2000 MW	31.03.2029
5	Edurumasturu	1000 MW	30.04.2031
6	Rajupalem	1000 MW	30.04.2031
	Total	**11000 MW**	

The proposal includes 8,802 ckm of transmission lines and 9500 MVA of transformation capacity, as per details given below:

S. No.	Description of work	Line Length in ckm			Transformation Capacity MVA
		400 kV	220 kV	Total	
1	400/220kV PS Mudigubba and connected lines	2060	380	2440	2500
2	400/220kV PS Talupula and connected lines	1940	520	2460	2500
3	400/220kV SS Ramayapatnam and connected lines	1692	-	1692	1500
4	400/220kV PS Porumamilla and connected lines	20	200	220	1500
5	400/220kV Koppaka and connected lines	1160	-	1160	1500
6	7370 MW PSP Evacuation Scheme	470	-	470	-
7	400kV Upper Sileru Transmission Scheme	360	-	360	-

S. No.	Description of work	Line Length in ckm			Transformation Capacity MVA
		400 kV	220 kV	Total	
8	Bay Extensions at existing substations and 125 MVAR Bus Reactor at Podili 400/220kV SS	-	-	-	-

4.4 Additional RE Capacity to be integrated to Intra-state transmission system in Andhra Pradesh

Sl No	Name of the Pooling Station	Type of Generation	Capacity (MW)
1	400 kV Mudigubba	Solar	3000
2	400 kV Talupula	Solar	3000
3	400 kV Porumamilla	Solar	3000
	Total		**9000**

4.5 Status of transmission system under ISTS for major RE Zones in Andhra Pradesh

RE Zones	Kurnool (GW)	Krishnagiri (GW)	NP Kunta (GW)	Ananthapuram (GW)	Kadapa (GW)	Total (GW)
Commissioned (GW)	7	-	2	3.5	-	12.5
Under implementation (GW)	12	4.5	-	10.5	3	30
Under Planning / To be planned (GW)	-	3	-	4.5	4.5	12
Total (GW)	**19**	**7.5**	**2**	**18.5**	**7.5**	**54.5**

In addition to above, MNRE has declared additional potential of 29 GW in the State of Andhra Pradesh and transmission system will be planned based on the generation resource adequacy studies.

4.6 Challenges in RE integration and planning of STATCOMs

India has set an ambitious target of 500 GW of non-fossil fuel-based Installed capacity by the year 2030. Going forward, the RE share in all India installed capacity will increase significantly in

comparison to that of conventional generators. This transition is expected to have limitations of providing Short Circuit Power & Dynamic Reactive Power and may also introduce harmonics in the power system. Power System Inertia, Short Circuit Power and Dynamic Reactive Power, which are the key elements of grid stability have inherently been provided by the conventional generators. Therefore, the increase in renewable energy sources coupled with the withdrawal of conventional energy-based plants will pose considerable challenges for grid stability in future.

Andhra Pradesh has a huge potential of renewable energy. As mentioned above, transmission system for integration of around 62 GW of RE has already been planned which are under various stages of implementation. In view of the various challenges with integration of RE, STATCOMs have been planned in Andhra Pradesh for dynamic reactive compensation, details of which are given below:

Table 4.3: STATCOMs planned under InSTS

S.No.	Substation	Statcom	MSC/MSR	Status
1	Mudigubba	+/- 150 MVAR, 400 kV	3x125 MVAr MSR	Planned under GEC-III
2	Talupula	+/- 150 MVAR, 400 kV	3x125 MVAr MSR	Planned under GEC-III
3	Makavaripalem	±300 MVAr, 400 kV	2x125 MVAr MSC & 1x125 MVAr MSR	-
4	Padmanabham	±300 MVAr, 400 kV	2x125 MVAr MSC & 1x125 MVAr MSR	-

Table 4.4: STATCOMs planned under ISTS

S.No.	Substation	Statcom	MSC/MSR	Status
1	Ananthapuram-II	± 300 MVAr, 765 kV	2x125 MVAr MSR	Under implementation
2	Ananthapuram-III	± 300 MVAr, 765 kV	2x125 MVAr MSR	Under bidding
3	Kurnool-IV	± 300 MVAr, 765 kV	2x125 MVAr MSR	Under bidding
4	Krishnagiri	± 300 MVAr, 765 kV	2x125 MVAr MSR	Under bidding

5	Kakinada	± 300 MVAr, 765 kV	2x125 MVAr MSC	Under bidding
6	Pendurthi	± 300 MVAr, 765 kV	2x125 MVAr MSC	Under bidding

Chapter-5
Recommendations

1. Intra-State Transmission system to be added by 2029-30 in Andhra Pradesh (220 kV and above) comprises of 3218.8 ckm of transmission lines and 21,850 MVA of transformation capacity as detailed below:

	Ckm and MVA to be added during 2025-30		
	400 kV	**220 kV**	**Total**
Transmission lines (ckm)	1618	1600.8	**3218.8**
Transformation Capacity (MVA)	6130	15720	**21850**

In addition, reconductoring of some of the transmission lines (about 493 ckm) with HTLS conductors is also required in the same timeframe.

2. Intra-State Transmission system planned to be added during 2030-35 comprises of 10,240 ckm of transmission lines and 20,200 MVA of transformation capacity as detailed below:

	Ckm and MVA to be added during 2030-35		
	400 kV	**220 kV**	**Total**
Transmission lines (ckm)	5660	4580	**10240**
Transformation Capacity (MVA)	17000	3200	**20200**

3. As per the short circuit studies, it has been observed that the fault level at various substations is either near or higher than the designed limits. Therefore, bus splitting arrangement/ implementation of series reactors have been proposed at these substations. It is also suggested to replace the equipment with the higher rating equipment, so as to restore the bus split arrangement and enhance the reliability of power supply. Considering the high fault levels in Andhra Pradesh, it is recommended that all new substations should be planned with higher short circuit capacity as per the manual on Transmission Planning Criteria.

4. APTRANSCO should keep adequate space provision in the new substations for extension/augmentation to meet future load growth. Also, APTRANSCO should provide appropriate space provisions for 66 kV and 33 kV bays in their 220/66 kV and 220/33 kV grid substations for supply of power to DISCOMs.

5. Transmission schemes which are planned/under planning for implementation till 2029-30 and 2034-35, may be taken up earlier or later as per requirement of Discom, actual load growth, integration of RE etc.

6. Huge Green Hydrogen/Green Ammonia loads and Data Center loads are coming up in the State. Accordingly, the Resource Adequacy study for transmission system in the State may be reviewed in the coming months.

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Annexure A

Transmission schemes to be added in Andhra Pradesh under Intra-State by 2029-30

Sl. No.	Transmission Scheme/Details	Voltage (kV)	Line Length (in ckm)	Total MVA	Status (Under Construction/ Planned)	Anticip ated SCoD
1.i	400KV Twin HTLS DC line from 400KV Podili to 400KV Ramayapatnam (96KM)	400	192		Planned	2029-30
ii	400kV TMDC (HTLS) line from 400/220kV SS Jammalamadugu to 400/220kV SS Ramayapatnam(210km)	400	420		Planned	2029-30
iii	1*125MVAr Reactor at Ramayapatnam		0		Planned	2029-30
2	Establishing 400/220 kV SS Palasa 400 kV Bus extension from765/400KV SS Palasa	400/220.		1000	Planned	2028-29
i	220KV DC line from 220/132KV SS Tekkali to proposed 400/220KV SS Palasa	220	80		Planned	2028-29
3	Construction of 400/132KV GIS SS/Ainavilli 2*315MVA	400/132		630	Under Construction	2026-27
i	LILO of 400 KV Vemagiri – Konaseema line at 400/132 KV Ainavilli SS.	400	46		Under Construction	2026-27
4	Construction of 400/220kV GIS Atchutapuram,2*500,1*125MVAr Reactor	440/220		1000	Under Construction	2026-27
i	Double LILo 1Km LILO of 400kV Kalapaka, Khammam Line & Kalapaka – Asupaka TMDC	400	4		Under Construction	2026-27
ii	Double LILo 17.45 KmLILO of 220kV VSS-Kakinada & Parwada-Anarak DC Line	220	69.8		Under Construction	2026-27
iii	400/220kV Atchutapuram GIS – 220KV Atchutapuram GIS DC UG Cable 2.31km .	220	4.62		Under Construction	2026-27
5	Construction of 400kV Polavaram - Guddigudem QMDC line	400	24		Under Construction	2026-27
6	Construction of 400/220 kV KAKINADA 2*500MVA,1*125MVAr Reactor	400/220		1000	Under Construction	2027-28
i	LILO of existing 400kV HNPCL - Kamavarapukota TMDC line to 400/220/132/33kV Kakinada SEZ SS.	400	15.04		Under Construction	2027-28
ii	220kV DC line from 220kV SS Ramavaram.	220	72		Under Construction	2027-28
iii	LILO of 220kV Samalkota-Anrak SC line and 220kV Kakinada-VSS SC line on MC Towers	220	48		Under Construction	2027-28
7	Construction of 400/220kV Gudiwada Substation. 2*500	400/220		1000	Under Construction	2026-27
i	LILO 400kV Vemagiri - Sattenapalli TMDC Line	400	90.2		Under Construction	2026-27
ii	Erection of 220 KV multi circuit line for making Double LILO of 220KV Gudivada-Akiveedu- Bhimavaram DC line at Proposed 400/220 KV SS Gudivada	220	76		Under Construction	2026-27
8	Double LILO of 400kV Manubolu-VTS Nunna DC Line(PGCIL Lines) at 400/220kV SS Podili	400	10		Under Construction	2029-30

i	Single LILO of 400kV Krishnapatnam-SEIL2DC Line at 400/220kV SS Ramayapatnam	400	230		Under Construction	2029-30
9	400KV TMDC line (40km) from 400KV Jammalamadugu sub-station to 400KV RTPP sub-station	400	82		Under Construction	2027-28
10	Augmentation of ICTs from 2 * 315 MVA to2 * 315 MVA +1*500 at 400/220/11 KV Guddigudem	400		500	Under Construction	2026-27
11	Augmentation of ICTs from 2 * 315 MVA to 2 * 315+ 1 * 500 MVA at 400/220/11 KV Kamavarapukota	400		500	Under Construction	2026-27
12	Augmentation of 1 No. 500MVA, 400/220kV ICT at 400kV SS Kalapaka.	400		500	Under Construction	2026-27
13	Augmentation of ICT capacity from 2×315MVA to 2×315MVA+1×500 MVA, at 400/220kV Kalikiri SS	400		500	Under Construction	2026-27
14	Augmentation of ICT capacity from 2×500MVA to 3×500 MVA, at 400/220kV Kakinada SS	400		500	Under Construction	2028-29
15	400KV Kalapaka-Simhadri DC line conductor replaced with AL65	400	8		Planned	2027-28
16	400KV Kalapaka-Gajuwaka DC line conductor replaced with AL65	400	8		Planned	2027-28

220 kV Level

Sl. No.	Transmission Scheme/Details	Voltage (kV)	Line Length (in ckm)	Total MVA	Status (Under Construction/ Planned)	Anticipated SCoD
1	Construction of 220/132/33 kV Sub-station at Koppaka, 0.5 KM on 2 Nos. Double Circuits for LILO of 220KV Nunna-Bhimadole S/C Line and LILO of 220KV Nuziveedu-KV Kota Line	220/132/33	2	320	Under Construction	2027-28
2	Construction of 220/132/33 kV Chapalamadugu SS , Double LILO (17KM) of the existing 220KV Srisailam-Tallapalli DC Line.	220/132/33	48.96	320	Under Construction	2026-27
3	Construction of 220/132/33 KV SS Pedana, 30KM 220KV DC Line with ACSS Conductor from the under construction 400KV SS at Gudiwada.	220/132/33	60	200	Planned	2028-29
4	Construction of 220/132/33kV SS/Gadivemula, 2 Nos 220kV DC/SC lines of about 0.857kM length each for single LILO of existing 220kV Somayajulapalli-Srisailam feeder.	220/132/33	1.714	320	Under Construction	2027-28
5	Construction of 220/132/33KV SS/Banavasi , 31KM 220KV DC Line for Single LILO of 220kV Mythra-Nansuralla DC Line	220/132/33	62	320	Under Construction	2026-27
6	Construction of 220/132/33kV with 2*160MVA at Vizianagaram Network: By LILO of 220kV Maradam-Pendurthy DC Line	220/132/33	19.6	320	Under Construction	2026-27

7	Construction of 220/132kV SS/Niluvugondla. Network: Construction of about 2.3 KM 220KV M/C Line for making Double LILO of 220kV Jammalamadugu-Bethamcherla D/C Line	220/132	9.2	320	Planned	2028-29
8	Construction of 220/132kV SS Devalampeta, 17 KM 220KV TMDC Line from 400/220kV SS/Chittor Construction of 2 nos. 220kV DC Lines about 1 kM length each for LILO of existing 220kV Chittor-Renigunta Line and existing 220kV Chittor-Nagari Line	220/132	38	480	Planned	2028-29
9	Construction of 220/132/33 kV SS at Kancharapalem, 11KM 220KV DC Line (7 KM UG + 4KM OH) from 220KV SS/Simhachalam	220/132/33	22	320	Planned	2028-29
10	Construction of 220/132/33 KV SS/Attili, 5 KM 220KV MC Line for Double Circuit LILO of 220kV Duvva-Undi DC Line.	220/132/33	20	320	Planned	2028-29
11	Construction of 220/132/33 KV SS/Vemuru. 35 KM 220KV DC Line from 400/220kV SS/Gudivada	220/132/33	70	320	Planned	2028-29
12	Construction of 220/132/33 KV SS at Chandanada. 220 KV DC line By making LILO of 220 KV VSS-Kakinada SC line and 220 KV Anrak-Samalkota SC line	220/132	64	400	Under Construction	2027-28
13	Construction of 220/132/33KV SS Tiruvuru, LILO of existing 220 KV KTPS - Nunna SC Line	220/132/33	10	300	Under Construction	2026-27
14	Upgradation of 132KV SS Tadepalli to 220KV SS Network: Erection of 220KV line from 400KV SS Tallayapalem to Proposed 220KV SS Tadepalli by laying UG cable upto Kondaveetivagu. Erection of 220KV line from 400KV SS Tallayapalem to Proposed 220KV SS Tadepalli by string of 220KV line on existing multicircuit towers from Kondaveetivagu	220/132	28.4	480	Under Construction	2027-28
15	Construction of 220/132/33kV SS,Sarubujili, 8 KM 220KV MC Line for making Double Circuit LILO of 220kV Garividi-Tekkali DC Line	220/132/33	32	320	Planned	2028-29
16	Construction of 220/132/33kV SS/Rajupalem by making 3kM 220kV DC line for Single LILO of 220kV Jammalamadugu-Porumamilla Line with 2 Nos. 160MVA PTRs	220/132/33	6	320	Planned	2028-29
17	Construction of 220/132kV SS/Tirupati with 2*160MVA PTRs, 1KM 220KV D/C Line for LILO of existing 220kV Chittor-Nagari Line, 1KM 220KV D/C Line for LILO of existing 220kV Chittoor-Renigunta Line	220/132	4	320	Planned	2028-29
18	Construction of 220/132kV SS/Jangareddy gudem with 2*160MVA, 30kM 220kV DC line from 400kV SS/Guddigudem.	220/132	60	320	Planned	2028-29
19	Construction of 220/132/33kV SS, Pogurupalli with 2*160MVA PTRs	220/132/33	30	320	Planned	2028-29

20	Construction of 220/132kV SS,Allinagaram with 2*160MVA PTRs , 40KM 220kV DC line from 220kV SS,Porumamilla.	220/132	80	320	Planned	2028-29
21	Upgradation of Narsipatnam SS to 220 KV Level by LILO of 220kV Upper Sileru-Pendurthy Feeder	220/132	0.6	320	Planned	2028-29
22	Upgradation of 132/33kV SS/Rudravaram by LILO of 220kV Srisailam-Mydukur Feeder	220/132	3	320	Planned	2028-29
23	Upgradation of existing 132 KV SS Aluru as 220 KV SS by laying 220kV DC Line from LILO point of 220kV Gooty-Alipura Line(Ragulapadu),finally by forming 220kV Ragulapadu-Aluru DC Line.	220/132	54	320	Planned	2028-29
24	Upgradation of existing 132/33kV SS, Addanki as 220/132/33kV SS by LILO of 220kV Podili-Parchuru Feeder	220/132	28	320	Planned	2028-29
25	132 kV Features at 400 KV SS Gudiwada.	220/132		480	Planned	
26	Proposal for providing 132kV and 33kV features at 220KV Switching Station, Tallapally	220/132		320		
27	Construction of 220/33kV SS Palakollu, 14kM 220kV D/C line from the proposed 220/132/33kV SS/Attili	220/33	28	160	Planned	2028-29
28	Construction of 220/33 KV SS at Shankavaram, Making SC LILO of upcoming 220kV Kakinada SEZ – Chandanada DC Line to the proposed 220/33kV SS Sankhavaram.	220/33	3	100	Planned	2028-29
29	Construction of 220/33kV SS,Dwarapudi ,Making Single LILO of existing 220kV Vemagiri-Samalkot(SSS) Line (0.5 km)	220/33	1	100	Planned	2028-29
30	Construction of 220/33 KV SS at Atchampeta, Making double LILO of 220KV VTPS-Rentachinthala D/C Line on MC Towers (OR) 2 Nos. DC Towers to the proposed 220/33 KV Atchampeta SS (LILO length: 6KM approx.).	220/33	24	100	Planned	2028-29
31	Construction of 220/33 KV at Lingayapalem, 8 KM 220KV DC UG cable from 400 KV GIS at Thallayapalem. (8km)and 0.5KM 220KV DC UG cable for LILO of existing 220KV VTPS-Narsaraopeta with UG Cable (0.5km)	220/33	17	240	Under Construction	2027-28
32	Construction of 220/33KV SS Nelapadu , 220KV Line from Thallayapalem to Nelapadu (UG Cable) Erection of OH line by making LILO of 220 KV VTS-Podili line to the proposed 220/33 KV GIS Nelapadu	220/33	20.4	200	Under Construction	2027-28
			753.5	8740		
1	Replacement of conductor with AL59 (HTLS) conductor on 220 kV VSS - Gajuwaka	220	6.3		Planned	2027-28
2	Replacement of conductor with AL59 (HTLS) conductor on 220 kV Gangavaram - VSS feeder	220	9.9		Planned	2027-28

3	Replacement of conductor with AL59 (HTLS) conductor on Kalpaka - VSS dc line	220	8		Planned	2027-28
4	Replacement of conductor with AL59 (HTLS) conductor on 220 kV Lower Sileru - Bommuru SC line	220	112		Planned	2027-28
5	Proposed replacemnt of existing conductor on 220 KV rachagunneri renigunta DC Line with equivalent HTLS conductor technical feasibility	220	36		Planned	2027-28
6	Replacement of existing conductor with equivalent HTLS Conductor on 220kV Gangavaram Port-Gajuwaka Line	220	6.3		Planned	2027-28
			178.5			
1	Erection of 2nd LILO of 220 kV Chinakampalli - Renigunta line at 220 kV Rajampet SS	220	6.3		Under Construction	2027-28
2	Making double CKT LILO from Proposed 220 KV Gudivada(400 KV Gudiavada) Akiveedu DC line	220	29		Under Construction	2027-28
3	LILO of 220 KV Kalpaka - simhachalam line at Parwada SS.	220	1.6		Under Construction	2027-28
4	2nd circuit LILO of 220kV Srisailam-Podili DC Line at Markapur SS	220	17		Under Construction	2027-28
5	Proposal for 2nd Circuit stringing on 220 KV Madanapally - Palamaner DC/SC line for a length of 58.22 KM along with 1 no. bay extensions at each end.	220	58.2		Under Construction	2027-28
6	System studies for making single LILO of 220 KV Kalapaka- HPCL D/C line at 220 KV SS/Gangavaram Port Technical feasibility	220	1.5		Planned	2027-28
7	220kV Single LILO of existing 220kV Jammalamadugu-Porumamilla DC Line to existing 220kV SS Mydukuru on Multi Circuit Towers	220	8.1		Under Construction	2027-28
			121.7			
1	220/132/33 KV Undi SS, Proposal for augmentation of PTR Capacities from 2 * 160 + 1 * 100 MVA to 3 * 160 MVA .	220/132		60	Under Construction	2026-27
2	220kV SS Palamaneru Augmentation of PTR Capacity from 1x160+1x100MVA to 1x160+2x100MVA	220/132		100	Under Construction	2026-27
3	Augmentation of PTRs at 220kV SS/Pallantla from 2*100MVA to 1*100+1*160MVA.	220/132		60	Under Construction	2026-27
4	Augmentation of 220/132 kV Power Transformer capacity from 1x160 + 2x100 MVA to 2x160 + 1x100 MVA at 220/132/33 kV SS Garividi.	220/132		60	Under Construction	2026-27
5	Augmentation of PTR capacity from 1x160MVA +2x100MVA to 2x160MVA+1x100MVA at 220KV SS Parchur	220/132		60	Under Construction	2026-27
6	Proposal for augmentation of power Transformer capacity i) from (2x160+1x100) MVA to (3x160) MVA at 220 KV SS Gudivada &	220/132		60	Under Construction	2026-27

7	Augmentation from 1 X 160 + 2X100MVA to 2X160MVA + 1X100MVA at 220KVSS Markapur	220/132		60	Under Construction	2026-27
8	Augmentation of Power Transformer capacity from 2x100MVA to (1x160+2x100) MVA at 220/132/33 KV SS Naidupeta	220/132		160	Under Construction	2026-27
9	Augmentation of PTR capacity from (1x100) MVA to (2x100) MVA at 220/132 kV Vajrakarur SS,	220/132		100	Under Construction	2026-27
10	Proposal for Augmentation of Power Transformer Capacity from (2X100 MVA) to (2X100 MVA + 1X160 MVA) at 220/132 KVSS Atmakur	220/132		160	Under Construction	2027-28
11	Augmentation of PTR capacity from 2x100+1x160MVA to 1x100+2x160 MVA at 220/132KV SS Renigunta	220/132		60	Under Construction	2027-28
12	Augmentation of PTR capacity from 2x100+1x160MVA to 1x100+2x160 MVA at 220/132KV SS Chittoor	220/132		60	Under Construction	2027-28
13	Augmentation of PTR capacity from (2x100) MVA to (1x160+2x100) MVA at 220/132 kV Porumamilla SS	220/132		160	Under Construction	2027-28
14	Augmentation of Power Transformer capacity from 3x100MVA to (1x160+2x100) MVA at 220KVSS Sullurpeta	220/132		60	Under Construction	2027-28
15	Augmentation of PTR capacity from existing 2x100 MVA to 2x100+1x160 MVA at 220/132 KV Mutyalacheruvu SS	220/132		160	Under Construction	2027-28
16	Augmentation of 2 Nos PTR capacities at 220/132/33KV SS Nagari from 3X100MVA to 1X160+2X100MVA	220/132		60	Under Construction	2027-28
17	Augmentation of PTRs from (1*100+1*160) MVA to (1*100+2*160) MVA at 220KVSS Pydibhimavaram	220/132		160	Under Construction	2027-28
18	Proposal for augmentation of PTR capacity from (2*160) VA to (3*160) MVA at 220/132/33 KV Nunna SS	220/132		160	Under Construction	2027-28
19	Augmentation of Power Transformer capacity from 3x100MVA to (1x160+2x100) MVA at 220KVSS Sullurpeta	220/132		602	Under Construction	2027-28
20	Augmentation of PTR capacity from (2x100) MVA to (1x160+2x100) MVA at 220/132 kV Porumamilla SS	220/132		160	Under Construction	2027-28
21	Augmentation of PTR capacity from existing 1x100+2x160 MVA to 3x160 MVA at 220 KV Samalkota SS.	220/132		60	Under Construction	2027-28
22	Augmentation of PTR capacity from existing 1x100+1x160 MVA to 1x100+2x160 MVA at 220 KV Pydibhimavaram SS.	220/132		160	Under Construction	2027-28
23	Proposed augmentation of 220/132kV Power Transformers from 2*160+2*100 to 4*160MVA at 220/132kV SS/KV Kota	220/132		120	Planned	2028-29
24	Augmentation of 220/132kV PTRs capacity from 2*100MVA to 3*100MVA at 220/132/33kV SS/Simhachalam	220/132		100	Planned	2028-29
25	Augmentation of 220/132kV Power Transformers from 3*100+1*160 to 2*100+2*160 MVA at 220/132/33kV SS/Tadikonda	220/132		60	Planned	2028-29

26	Augmentation of 220/132kV Power Transformers from 1*160+2*100 to 2*160+1*100MVA at 220/132/33kV SS/Narsaraopet	220/132		60	Planned	2028-29
27	Augmentation of 220/132kV PTRs capacity from 3*100 to 2*160+1*100 MVA at 400/220/132kV SS/Manubolu	220/132		120	Planned	2028-29
28	Augmentation of 220/132kV PTRs capacity from 3*100 to 3*100+1*160MVA at 220/132/kV SS/Brandix	220/132		160	Planned	2028-29
29	Augmentation of 220/132kV PTRs capacity from 1*100+2*160MVA to 3*160MVA at 220/132/kV SS/Kakinada	220/132		60	Planned	2028-29
30	Augmentation of 220/132kV PTRs from 3*100 MVA to 1*160+ 2*100MVA at 220/132/33kV SS/Kalikiri	220/132		60	Planned	2028-29
31	Augmentation of 220/132kV PTRs from 3*100 MVA to 1*160+ 2*100MVA at 220/132/33kV SS/Kalyandurg	220/132		60	Planned	2028-29
32	Proposed augmentation of 220/132kV Power Transformers from 1*100+2*160 to 2*100+2*160 MVA at 220/132/33kV SS/Ongole	220/132		100	Planned	2028-29
33	Proposed augmentation of 220/132kV Power Transformers from 3*100 to 1*160+2*100 MVA at 220/132/33kV SS/Chillakallu	220/132		60	Planned	2028-29
34	Augmentation of 160MVA PTR at 220kV GIS Atchutapuram.	220/132		160	Under Construction	2026-27
35	225MW (450 MWH) BESS connectivity at 220 KV level of 400/220 KV SS Jammalamadugu, with 220/33KV 4*80MVA PTRs	220/33		320	Under Construction	2027-28
36	225MW (450 MWH) BESS connectivity at 220 KV level of 400/220 KV SS Ghani, with 220/33KV 4*80MVA PTRs	220/33		320	Under Construction	2027-28
37	50MW (100 MWH) BESS connectivity at 220 KV level of 220/132 KV SS Kuppam, with 220/33KV 2*80MVA PTRs	220/33		160	Under Construction	2027-28
38	225MW (450 MWH) BESS connectivity at 220 KV level of 400/220 KV SS Hindupur, with 220/33KV 4*80MVA PTRs	220/33		320	Under Construction	2027-28
39	275 MW (550 MWH) BESS connectivity at 220 KV level of 400/220 KV SS Talaricheruvu, with 220/33KV 5*80MVA PTRs	220/33		400	Under Construction	2027-28
40	225MW (450 MWH) BESS connectivity at 220 KV level of 400/220 KV SS Pampanurtanda, with 220/33KV 4*80MVA PTRs	220/33		320	Under Construction	2027-28
41	150 MW (300 MWH) BESS connectivity at 220 KV level of 400/220 KV SS Kalikiri, with 220/33KV 3*80MVA PTRs	220/33		240	Under Construction	2027-28
42	75MW (150 MWH) BESS connectivity at 220 KV level of 400/220 KV SS Maradam, with 220/33KV 2*80MVA PTRs	220/33		160	Under Construction	2027-28

Annexure-B

Transmission schemes to be added in Andhra Pradesh under ISTS by 2029-30

S.No.	Scheme /details	Voltage level (kV)	Total ckm	Total MVA	Status	Anticipated SCoD
1	**Transmission scheme for Solar Energy Zone in Ananthpuram (Ananthapur) (2500 MW) and Kurnool (1000 MW), Andhra Pradesh**	400/220			Under Construction	June 2026
	Establishment of 400/220 kV, 7x500 MVA pooling station at suitable border location between Ananthpuram & Kurnool Distt with 400kV (2x125 MVAR) bus reactor			3500		
	Ananthpuram PS-Kurnool-III PS 400 kV (Quad moose) D/c Line					
	Ananthpuram PS-Cuddapah-400kV (Quad moose) D/c Line		371			
	80 MVAr, 420 KV switchable line reactor at Ananthpuram PS for each circuit of Ananthpuram PS-Cuddapah 400 kV D/c line along with associated switching equipment					
2	**Transmission system strengthening at Kurnool- III PS for integration of additional RE generation projects**	765/400			Under Construction	June 2027
	Augmentation of transformation capacity by 3x1500 MVA, 765/400 kV ICTs at Kurnool-III PS			4500		
	Kurnool-III PS – Chilakaluripeta 765 kV D/c line with 240 MVAr switchable line reactors at both ends		589			
	Augmentation of 1x1500 MVA 765/400 kV ICT (7th) at Kurnool-II PS			1500		
	Inter-Regional Strengthening between SR Grid and ER Grid	765			Under Construction	August 2028
	Angul – Srikakulam 765 kV 2nd D/c line with 240 MVAR SLR at both ends on both circuits		550			
	1x330 MVAR, 765 kV bus reactor (3rd) at Angul Substation					
3	**Transmission System for Integration of Anantapur-II REZ - Phase-I (for 4.5 GW)**	765/400/220			Under Construction	April’ 2027
	Establishment of 4x1500 MVA, 765/400 & 6x500 MVA, 400/220 kV Ananthapuram-II Pooling Station near Kurnool, Andhra			9000		

	Pradesh along with 2x330 MVAr (765 kV) bus reactors at Ananthapuram-II PS					
	Ananthapuram-II – Davangere 765 kV D/c line (about 150km) with 240 MVAR SLR (convertible) at Ananthapuram-II end on both circuits		180			
	Ananthapuram-II – Cuddapah 765 kV D/c line (about 200km) with 330 MVAR SLR (convertible) at Ananthapuram-II end on both circuits		432			
	+300 MVAR STATCOM at Ananthapuram-II PS along with 2x125 MVAr MSR					
4	**Transmission System for Integration of Kurnool-IV REZ – Phase-I (for 4.5 GW)**	765/400/220			Under Construction	Sep' 2027
	Establishment of 4x1500 MVA, 765/400 kV & 4x500 MVA, 400/220 kV Kurnool-IV Pooling Station near Kurnool, Andhra Pradesh along with 2x330 MVAr (765 kV) bus reactors at Kurnool-IV PS			8000		
	Kurnool-IV – Bidar 765 kV D/c line (about 330 kms) with 330 MVAR SLR (convertible) at both ends on both circuits		692			
	Kurnool-IV – Kurnool-III PS 765 kV D/c line (about 150 kms) with 240 MVAR SLR (convertible) at Kurnool-IV end on both circuits		246			
	300 MVAr STATCOM at Kurnool-IV PS along with 2x125 MVAr MSR					
	Augmentation by 1x1500 MVA, 765/400 kV ICT (3rd) at C'Peta			1500		
	LILO of Vijayawada-Nellore 400 kV D/C line at C'Peta		70			
5	**Transmission System for Kurnool-IV REZ - Phase-II**	765/400/220			Under Construction	June 2029
	Augmentation of Kurnool-IV PS by 400/220 kV, 4x500 MVA ICTs			2000		
	220 kV line bays at Kurnool-IV PS for termination of dedicated transmission lines of RE generation projects					
	400 kV line bay at Kurnool-IV PS for termination of dedicated transmission lines of RE generation projects					
	Augmentation of Kurnool-IV PS by 765/400 kV, 2x1500 MVA and 400/220 kV, 6x500 MVA ICTs			6000		
	220 kV line bays at Kurnool-IV PS for termination of dedicated transmission lines of RE generation projects					

	400 kV line bay at Kurnool-IV PS for termination of dedicated transmission lines of RE generation projects					
	Establishment of 4x1500 MVA, 765/400 kV Doma Station with 2x330 MVAr (765 kV) bus reactors with space provision for establishment of 220 kV switchyard	765/400		6000		
	LILO of Kurnool-IV – Bidar 765 kV D/c line at Doma		40			
	Doma – Shadnagar GIS S/s (TGTRANSCO) 400 kV Twin HTLS D/C line {TGTRANSCO to upgrade Shadnagar GIS (TGTRANSCO) S/s to 400 kV in matching time frame}		80			
	Doma – Kethiredipally (TGTRANSCO) 400 kV Twin HTLS D/C lin		100			
6	**Transmission System for Integration of Ananthapuram-II REZ - Phase-II**	765/400/220			Under Construction	April 2028
	Augmentation of Ananthapuram-II PS by 400/220 kV, 1x500 MVA ICT			500		
	220 kV line bays at Ananthapuram-II PS for termination of dedicated transmission lines of RE generation projects					
	400 kV line bays at Ananthapuram-II PS for termination of dedicated transmission line of RE generation projects					
	Augmentation of Ananthapuram-II PS by 765/400 kV, 2x1500 MVA and 400/220 kV, 6x500 MVA ICTs			6000		
	220 kV line bays at Ananthapuram-II PS for termination of dedicated transmission lines of RE generation projects					
	Establishment of 3x1500 MVA, 765/400 kV CN'Halli Station with 2x330 MVAr (765 kV) bus reactors			4500		
	Ananthapuram-II PS – CN'Halli 765 kV D/c line (about 180 km) with 330 MVAr SLR at Ananthapuram-II end on both circuits		363			
	LILO of one circuit of Talaguppa - Neelmangala 400 kV D/c line at CN'Halli		38			
	LILO at CN'Halli of already LILOed section of one circuit of Talaguppa - Neelmangala 400 kV line at Hassan		71			
7	**Transmission System for Kurnool Wind Energy Zone/ Solar Energy Zone (AP) – Part-A & Part-B**	765/400/220			Under Construction	Oct 2027
	Establishment of 765/400 kV 3x1500 MVA, 400/220 kV 9x500 MVA Pooling Station at suitable location in Kurnool Distt (Kurnool-III) with 1x330MVAr (765 kV) & 1x125 MVAr (400 kV) bus reactors			1000		

8	**Augmentation of Transformation Capacity at 400/220KV NP Kunta PS in Andhra Pradesh by 1x500MVA, 400/220KV ICT (5th) and Implementation of common facility works for providing connectivity to RE generation**	400/220		500	Under Construction	July 2026
9	**Augmentation of Transformation capacity at 400/220kVNagarjunasagar S/s in Andhra Pradesh by 1x500MVA, 400/220kV ICT (4th)**	400/220		500	Under Construction	May 2027
10	**Transmission system for proposed Green Hydrogen / Green Ammonia projects in Kakinada area, Andhra Pradesh (Phase-I)**	765/400			Under Bidding	
	Establishment of Kakinada 765/400 kV, 3x1500 MVA substation (GIS) alongwith 240 MVAr bus reactor			4500		
	LILO of Vemagiri – Srikakulam 765 kV D/c line at Kakinada substation {with 240 MVAr SLR at Kakinada GH end on Srikakulam – Kakinada section}		80			
	• + 300 MVAr STATCOM with 2x125 MVAr MSC at Kakinada 765/400 kV GIS S/s with control switching arrangement for proposed 1x240 MVAr bus reactor • Space provision for 2nd+ 300 MVAr STATCOM with 2x125 MVAr MSC at Kakinada 765/400 kV S/s					
11	**Transmission System for integration of Krishnagiri REZ Phase-I**	765/400/220			Under Bidding	
	Establishment of 4x1500 MVA, 765/400 kV and 5x500 MVA, 400/220kV Krishnagiri Pooling Station near Kodumur in Kurnool district along with 2x330 MVAr (765 kV) bus reactors at Krishnagiri PS			8500		
	± 300 MVAr STATCOM at Krishnagiri PS					
	Krishnagiri– Doma 765 kV D/c line with 240 MVAr SLR (convertible) at both ends on both circuits		480			
	Krishnagiri – Raichur New 765 kV D/c line with 240 MVAr SLR (convertible) at Raichur New end on both circuits		300			
	Establishment of 3x1500 MVA, 765/400 kV Sagar substation with 2x330 MVAr (765 kV) bus reactors			4500		
	Krishnagiri – Sagar 765 kV D/c line with 240 MVAr SLR (convertible) at both ends on both circuits		480			
	Sagar – Nagarjunasagar 400 kV D/c line		50			
12	**Transmission System for integration of Ananthpuram-III PS REZ Phase-I**	765/400/220			Under Bidding	
	Establishment of 3x1500 MVA, 765/400 kV and 7x500 MVA, 400/220kV Ananthapuram-III Pooling Station near Urvakonda / Beluguppa / Kalyandurg areas in Anantapur			8000		

	district along with 2x330 MVAr (765 kV) bus reactors at Ananthapuram-III PS					
	+ 300 MVAr STATCOM at Ananthapuram-III PS					
	Ananthapuram-III – Krishnagiri 765 kV D/c line with 240 MVAr SLR (convertible) at Ananthapuram-III end on both circuits		280			
13	**Transmission system for proposed Green Hydrogen / Green Ammonia projects in Vizag area, Andhra Pradesh (Phase-I)**	765/400			Under Bidding	
	Establishment of 4x1500 MVA, 765/400 kV Pendurthi (Vizag) GIS substation with 1x330 MVAr (765 kV) bus reactor			6000		
	• ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS with control switching arrangement for proposed 1x330 MVAr bus reactor • Space provision for 2nd ± 300 MVAr STATCOM with 2x125 MVAr MSC at Pendurthi (Vizag) GIS					
	Pendurthi (Vizag) – Srikakulam 765 kV D/c line with 330 MVAr SLR (convertible) at Srikakulam end on both circuits		400			
	LILO of Kalpakka – Maradam 400 kV (quad) D/c line at Pendurthi (about 20 km)		80			
	Establishment of 3x1500 MVA, 765/400 kV Khammam-II substation with 1x330 MVAr (765 kV) bus reactor			4500		
	Khammam-II – Warangal New 765 kV D/c line		200			
	Khammam-II – Pendurthi (Vizag) 765 kV D/c line with 330 MVAr SLR (convertible) at both ends on both circuits		700			
	Khammam-II – Khammam (existing) 400 kV (quad) D/c line (about 20 km)		40			
14	**Augmentation of transformation capacity by 1x500 MVA, 400/220kV ICT (6th) at N P Kunta PS in Andhra Pradesh**	400/220		500	Under Planning	
15	**Reconductoring of Gooty – Tumkur (Pavagada) 400kV D/c line with HTLS conductor**	400			Under Planning	

Annexure-C

Transmission schemes to be added in Andhra Pradesh under Intra-STS during 2030-35

Sl. No.	Transmission Scheme/Details	Voltage (kV)	Line Length (in ckm)	Total MVA	Status	SCoD
1	**400/220kV PS Mudigubba and connected lines for 5GW evacuation**					
i	400/220kV PS Mudigubba,+/- 150MVAr Statcom with 3*125MVAr MSR	400/220		2500	Planned	2031-32
	Evacuation Lines					
ii	220kV ACSR Moose Line on MC Towers from PS-1 to 400/220kV PS Mudigubba(40km)	220.00	160		Planned	2031-32
iii	220kV ACSR Moose Line on MC Towers from PS-2 to 400/220kV PS Mudigubba(55km)	220.00	220		Planned	2032-33
iv	400kV Twin ACSR Moose MC line from PS-3 to 400/220kV PS Mudigubba(80km)	220.00	320		Planned	2031-32
	Interconnected Lines		0			
vi	400kV TMMC (HTLS) line from400/220kV PS Mudigubba to 400/220 kV SS Podili (240km)	400.00	960		Planned	2031-32
vii	400KV Twin HTLS DC line from 400KV Talaricheruvu – 400/220KV PS Mudigubba (by utilising portion of existing 400KV Talaricheru- Jammalamadugu 400KV line break point)(90km)	400.00	180		Planned	2031-32
2	**400/220kV PS Talupula and connected lines for 5GW evacuation**	400/220	0	2500		
i	400/220kV PS Talupula,+/- 150MVAr Statcom with 3*125MVAr MSR		0		Planned	2030-31
	Evacuation Lines		0			
ii	220KV ACSR Moose MC line from Pooling Station- 4 to 400/220KV PS Talupula (50KM).	220.00	200		Planned	2031-32
iii	220KV ACSR Moose MC line from Pooling Station- 5 to 400/220KV PS Talupula (80KM).	220.00	320		Planned	2030-31
iv	400KV Twin ACSR Moose MC line from Pooling Station-6 to 400/220KV PS Talupula (55KM).	400.00	220		Planned	2030-31
	Interconnected Lines		0			
v	400KV Twin HTLS MC line from 400/220KV Talupula PS to 400/220KV SS Ramayapatnam. (230km)	400.00	920		Planned	2030-31
vi	400KV Twin HTLS MC line from 400KV Gudivada (LILO point of 400KV Vemagiri- Sattenapalli DC line near Hanuman Junction) to 400/220KV SS at Kakinada SEZ(190KM)	400.00	760		Planned	2030-31

vii	400KV Twin HTLS DC line from 400KV Jammalamadugu –400/220KV PS Talupula (by utilising portion of existing 400KV Talaricheruvu- Jammalamadugu 400KV line break point)(90km)	400.00	180		Planned	2030-31
3	**400/220kV Ramayapatnam and connected lines**		0			
i	**400kV/220kV SS Ramayapatnam 3*500MVA**	400/220	0	1500		
ii	400KV Twin HTLS MC line from 400/220KV SS Ramayapatnam to 400KV Gudivada (220KM).	400.00	880		Planned	2030-31
4	**400/220kV PS Porumamilla and connected lines for 1GW Solar power evacuation**		0			
i	400/220kV PS Porumamilla, 1*125MVAr Reactor	400/220	0	1500	Planned	2032-33
ii	400kV Twin HTLS (Moose) Line on Multi Circuit Towers for Double LILO of 400KV Twin HTLS MC Line from 400KV Talapula PS to 400/220KV Ramayapatnam SS to 400/220KV Porumamilla PS	400.00	20		Planned	2032-33
iii	220kV ACSR Moose MC Line from PS-7 to 400/220KV PS Porumamilla (50)	220.00	200		Planned	2032-33
5	**400/220kV Koppaka and connected Transmission scheme**		0			
i	**400/220kV SS Koppaka, 3*500MVA, 1*125MVAr Reactor**	400/220	0	1500	Planned	2031-32
ii	400KV Twin HTLS MC line from 400KV Podili - Koppaka	400.00	880		Planned	2031-32
iii	400KV Twin HTLS MC line from 400KV Koppaka - K V Kota	400.00	140		Planned	2031-32
iv	400KV Twin Moose MC line for Double LILO of 400KV Acthyutapuram-Asupaka/Khammam DC line at Kamavarapukota (35KM).	400.00	140		Planned	2031-32
6	Establishing upgradation of proposed 220 kV Attili Sub station as 400/220 kV Attili Sub station in West Godavari District 1. 400 kV QMDC line from Koppaka to 400/2200 kV SS Attili sub-station. 2. 3x500 MVA, 400/220 KV Power transformers at Attili. 3. 1X125MVAR, 400kV bus reactor at Koppaka.	400/220	140	1500	Planning	2030-31
7	Establishing 400/220 kV Makavaripalem Sub station in vishakapatnami District 1. 400 kV QMMC line from Koppaka to 400/2200 kV SS Makavaripalem sub-station. 2. 3x500 MVA, 400/220 KV Power transformers at Makavaripalem. 3. 2X125MVAR, 400kV bus reactor at Makavaripalem.	400/220	960	1500	Planning	2030-31

	4.STATCOM (±300 MVAr) along with 2x125 MVAr MSC & 1x125 MVAr MSR and associated bays					
8	Establishing 400/220 kV Padmanabham Sub station in vishakapatnami District 1. 400 kV QMMC line from Padmanabham to 400/2200 kV SS kakinada SEZ-AP sub-station. 2. 3x500 MVA, 400/220 KV Power transformers at Makavaripalem. 3. 2X125MVAR, 400kV bus reactor at Padmanabham. 4.STATCOM (±300 MVAr) along with 2x125 MVAr MSC & 1x125 MVAr MSR and associated bays	400/220	640	1500	Planning	2030-31
9	1. 400 kV QMMC line from 765/400KV SS Pendurthy to 400/220 kV SS Padmanabham sub-station.	400	180		Planning	2032-33
10	1. 400 kV QMMC line from 765/400KV SS Pendurthy to 400/220 kV SS Makavaripalem sub-station.	400	180		Planning	2032-33
11	1.Establishing 400 kV SWS Chinnipalem 1. 400 kV QMDC line for Single LILO of 400KV Kalapaka-Maradam DC line at Proposed 400KV SWS Chinnipalem.	400	20		Planned	2030-31
12	1.Establishing 400/220 kV SS Nagalapuram 2. 400 kV QMDC line frm Proposed 765/400KV SS chennai-II	400/220	50	1500	Planning	2032-33
	220KV TMDC line from 400/220 kV SS Nagalapuram to 220/132KV SS Racherla	220	50		Planning	2032-33
	220KV TMDC line from 400/220 kV SS Nagalapuram to 220/132KV SS Nagari	220	50		Planning	2032-33
13	1.Establishing 400/220 kV SS Ramakuppam 2. 400 kV QMDC line frm Proposed 765/400KV SS Malur	400/220	120	1500	Planning	2030-31
	220KV TMDC line from 400/220 kV SS Ramakuppam to 220/132KV SS Pogurupalli	220	60		Planning	2030-32
	220KV SMMC line forDouble LILO of 220KV Palamaneru-Kuppam DC line at 400/220KV SS Ramakuppam	220	20		Planning	2030-31
14	220/132KV SS Anakapalli 220KV TMDC line from 765/400/220KV SS Pendurthy to 220/132KV SS Anakapalli	220/132	50	320	Planning	2030-31
15	220/132KV SS Sabbavaram 220KV TMDC line from 765/400/220KV SS Pendurthy to 220/132KV SS Sabbavaram	220/132	40	320	Planning	2032-33
16	220/132KV SS Kottavalasa 220KV TMDC line from 765/400/220KV	220/132	50	320	Planning	2031-32

	SS Pendurthy to 220/132 KV SS Kottavalasa					
17	220/132KV SS Bhogapuram 220KV TMDC line from 400/220KV SS Padmanabha to 220/132KV SS Bhogapuram	220/132	40	320	Planning	2032-33
	220KV TMDC line from 220/132KV SS Bhogapuram to 220/132KV SS Pydibhimavaram	220/132	40		Planning	2032-33
18	220KV TMDC line from 400/220KV SS Padmanabha to 220/132KV SS Bheemili	220	30		Planning	2031-32
19	220KV TMDC line from 400/220KV SS Bheemili to 220/132KV SS Kapuluppada	220	20		Planning	2031-32
20	220KV TMMC line from 400/220KV SS Palasa for making Double LILO of 220KV Palasa -Sarbhujili Dc line	220	140		Planning	2030-31
21	220/132KV SS Srikakulam 220KV SMDC line from 220/132KV SS Tekkali to 220/132KV SS Srikakulam	220/132	80	320	Planning	2034-35
22	220KV SMDC line from 400/220KV SS koppaka to 220/132KV SS Nuzvidu from LILO point	220	20		Planning	2031-32
23	220/132KV SS Mallavalli 220KV SMDC line from 400/220KV SS koppaka to 220/132KV SS Mallavalli	220/132	40	320	Planning	2032-33
24	1.220/132KV SS Uppuluru 2.SMMC (HTLS) line double LILo of Nunna-Gudivada Line	220/132	10	320	Planning	2030-31
25	220/132KV SS Bapatla 220KV TMDC line from 400/220KV SS Podili to 220/132KV SS Bapatla	220/132	160	320	Planning	2031-32
26	220/132KV SS Vidavaluru 220KV TMDC line from 400/220KV SS Senampudi to Vidavaluru	220/132	160	320	Planning	2030-31
27	220/132KV SS Veerulapadu 220KV TMDC line from 765/400/220KV SS Khammam	220/132	40	320	Planning	2034-35
	220KV SMMC line forDouble LILO of 220KV Kondapalli-Chillakallu DC line at220/132KV SS veerulapadu	220	20		Planning	2034-35
28	220KV TMDC line from 765/400/220KV SS Khammam to 220/132KV SS Tiruvuru	220	60		Planning	2034-35
29	220KV SMMC line forDouble LILO of 220KV Rentachintala-Achempeta DC line at 765/400/220KV SSSagar	220	60		Planning	2034-35
30	220KV TMDC line from 765/400/220KV SS Sagar to 220/132KV SS Piduguralla	220	10		Planning	2034-35
	Total		**10240**	**20200**		

Annexure-D

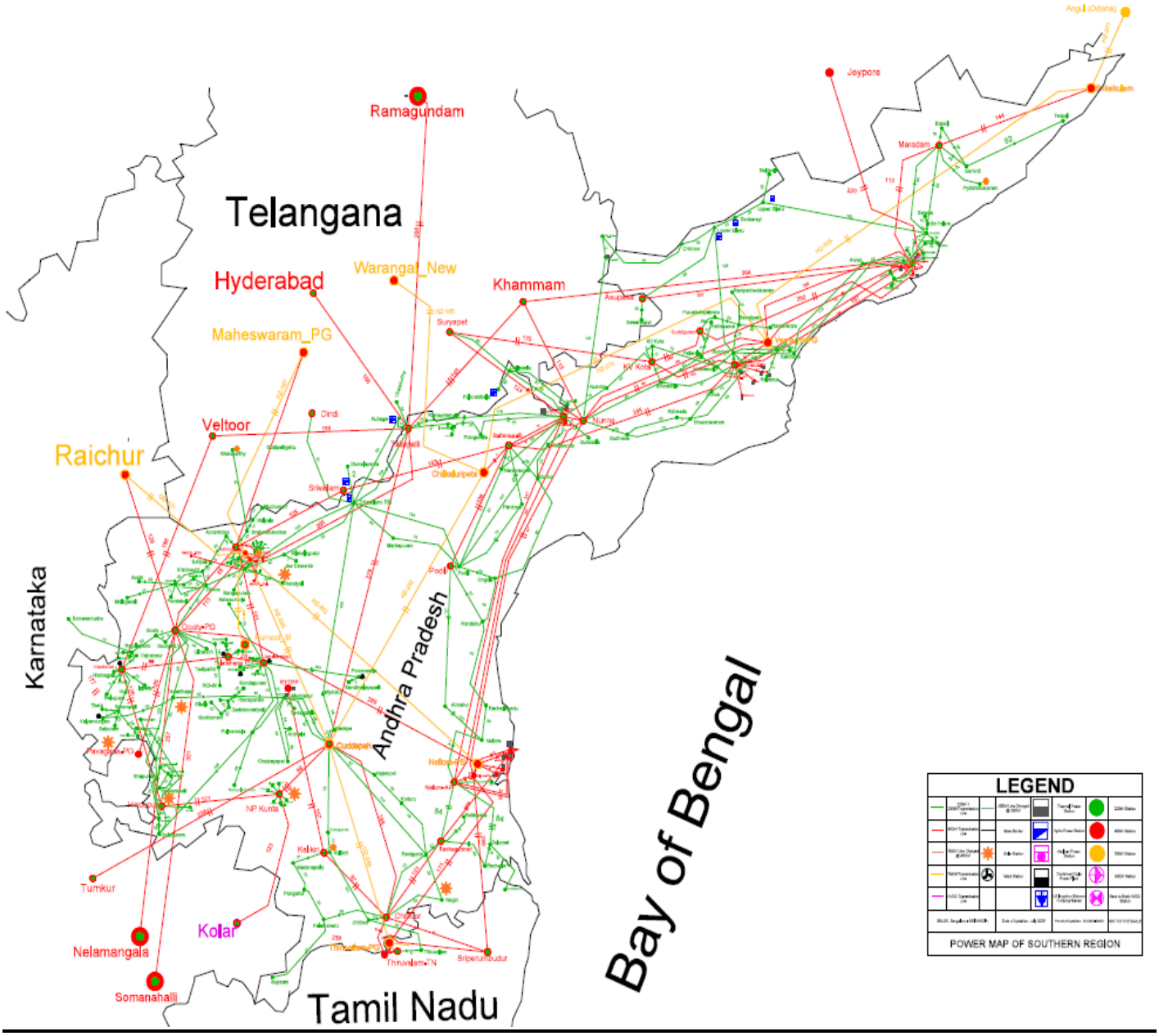
Transmission schemes to be added in Andhra Pradesh under ISTS during 2030-35

S.No.	Scheme /details	Voltage level (kV)	Total ckm	Total MVA	Status	Anticipated SCoD
1	**Transmission System for integration of Kadapa-II REZ**	765/400/220			Under Planning	
	Establishment of 4x1500 MVA, 765/400 kV and 5x500 MVA, 400/220kV Kadapa-II Pooling Station along with 2x330 MVAr bus reactor			8500		
	± 300 MVAr STATCOM at Kadapa-II					
	Kadapa-II – Thiruvelam 765kV D/c line 1x240 MVAr SLR (convertible) at both ends on both circuits		500			
	Ananthapuram-III – Kadapa-II 765kV D/c line with 1x330 MVAr SLR (convertible) at Ananthapuram-III end on both circuits		440			
	Augmentation of 2x1500 MVA, 765/400 kV and 5x500 MVA, 400/220kV Kadapa-II Pooling Station			5500		
	Upgradation of Nagapattinam GIS to 765 kV level with 2x1500 MVA, 765/400kV ICTs			3000		
	Thiruvelam – Nagapattinam 765kV D/c line 1x240 MVAr SLR (convertible) at both ends on both circuits		500			
2	**Transmission System for integration of Krishnagiri REZ - Phase-II**	765/400/220			Under Planning	
	Augmentation of 2x1500 MVA, 765/400 kV and 9x500 MVA, 400/220kV ICTs at Krishnagiri PS			7500		
	Krishnagiri – Nellore 765 kV D/c line 1x240 MVAr SLR (convertible) at both ends on both circuits		480			
	Khammam-II – Sagar 765 kV D/c line 1x240 MVAr SLR (convertible) at Khammam-II end on both circuits		300			
3	**Transmission System for Integration of Ananthapuram-III REZ Phase-II**	765/400/220			Under Planning	
	Augmentation of 3x1500 MVA, 765/400 kV and 7x500 MVA, 400/220kV ICTs at Ananthapuram-III PS			8000		

	Establishment of 2x1500 MVA, 765/400 kV GIS substation near Malur with 1x240 MVAr (765 kV) bus reactor with space provision for establishment of 220 kV switchyard at Malur			3000		
	Ananthapuram-III – Malur 765kV D/c line with 240 MVAr SLR (convertible) at both ends on both circuits		500			
	± 300 MVAr STATCOM at Malur					
	Malur – Somanahalli 400 kV (Quad) D/c line		160			
	Malur – Hosur 400 kV (Quad) D/c line		120			
	Malur – Dommasandra 400 kV (quad) S/c line		50			
4	**Transmission system for proposed Green Hydrogen / Green Ammonia projects in Vizag area, Andhra Pradesh Phase-II (for GH loads at Kakinada & Pendurthi)**	765/400			Under Planning	
	Augmentation of 2x1500 MVA, 765/400 kV ICTs at Pendurthi (Vizag)			3000		
	Augmentation of 3x1500MVA, 765/400 kV ICTs at Kakinada GH			4500		
	Sagar – Kakinada 765 kV D/c line with 1x330 MVAr SLR on both circuits on both ends		688			
	Pendurthi – Kakinada GH 765 kV D/c line with 1x240 MVAr SLR at Pendurthi end on both circuits		300			
5	**Transmission system for proposed Green Hydrogen / Green Ammonia projects in Ramayapatnam area (Phase-I)**	765/400			Under Planning	
	Establishment of 3x1500 MVA, 765/400 kV Ramayapatnam substation with 1x330 MVAr bus reactor and space provision for establishment of 400/220 kV switchyard			4500		
	±300 MVAr STATCOM at Ramayapatnam and space provision for additional 2nd STATCOM					
	Ramayapatnam – Kadapa-II 765 kV D/c line with 1x330 MVAr SLR at Kadapa-II end on both circuits		380			
	Ramayapatnam – Sagar 765 kV D/c line with 1x330 MVAr SLR at Ramayapatnam end on both circuits		400			

6	**Transmission system for proposed Green Hydrogen / Green Ammonia projects in Ramayapatnam area (Phase-II)**	765/400			Under Planning	
	Augmentation of 2x1500 MVA, 765/400 kV ICTs at Ramayapatnam			3000		
	LILO of Krishnagiri – Nellore PS 765 kV D/c line at Ramayapatnam		470			

Annexure-E


Telangana
Ramagundam
Hyderabad
Warangal_New
Khammam
Maheswaram_PG
Veltoor
Raichur
Karnataka
Andhra Pradesh
Bay of Bengal
Tamil Nadu
Kolar
Nelamangala
Somanahalli
Tumkur
Jeypore
Maradam
Nunna
Cuddapah
Kalikiri
Thiruvalam-TN
Sriperumbudur
LEGEND
POWER MAP OF SOUTHERN REGION