

**POWER TRANSMISSION
NETWORK AS PROJECTED BY
YEAR 2030 AND 2047.PRESENT
STATUS AND PLANNING TO
ACHIEVE THE SAME**

By

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UPSEB Trifurcation into UPPCL,UPRVUNL &UPJVN

- U.P. State Electricity Board, was responsible for generation, transmission and distribution of power within the state of Uttar Pradesh.
- On dated 14.01.2000, in accordance to U.P. State Electricity Reforms Acts 1999 and operation of U.P. Electricity Reforms Transfer Scheme 2000, U.P. State Electricity Board was trifurcated and responsibility for electricity transmission and distribution was given to Uttar Pradesh Power Corporation Limited (UPPCL), operations of the state sector thermal power stations were handed over to UPRVUNL, operations of the state sector HYDRO power stations were handed over to Uttar Pradesh Jal Vidyut Nigam Ltd.
- Subsequently, the Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited was fully amalgamated into Uttar Pradesh Jal Vidyut Nigam Limited and further new Entity was named as U.P. Rajya Vidyut Utpadan Nigam Limited through a gazette notification dated 03.11.2023, consolidating both thermal and hydroelectric power generation under one entity.

Brief Summary of UPPTCL

- UP Power Transmission Corporation Limited (UPPTCL) is a company incorporated under the Companies Act 1956.
- Established in 2006, UPPTCL's primary objective is managing, operating, and developing electrical transmission lines and networks in Uttar Pradesh, India, and beyond.
- UPPTCL's responsibilities include managing extra high voltage and high voltage transmission lines, sub-stations, cables, wires, and associated equipment.
- UPPTCL also coordinates power transmission agreements, conducts studies and research, and undertakes planning and coordination activities for the power system in the state.

Uttar Pradesh: Projected Per Capita Electricity Consumption and Peak Power Demand (2030–2047)

- 1. **Per Capita Electricity Consumption**

Uttar Pradesh's current per capita electricity consumption is approximately 660-750 kWh per person per year (2025–26).

Assuming continued economic growth, industrialization, urbanization, rising household incomes, and improved electricity access, the following projections are reasonable:

Year	Estimated Per Capita Consumption (kWh/person/year)
2026	660-750
2030	1,200 – 1,500
2040	2,000 – 2,800
2047	3,000 – 4,000

Uttar Pradesh: Projected Per Capita Electricity Consumption and Peak Power Demand (2030–2047)

- Uttar Pradesh's total electricity consumption reached about 162.9 billion units (BU) in FY 2025–26, more than double the level of 2012–13.
- At an average of 3,500 kWh per capita by 2047 and a population of around 30 crore, Uttar Pradesh would require roughly 1,050 BU/year of electricity, with peak demand likely in the 130–150 GW range.

Achieving this demand would require massive investments in generation, transmission, energy storage, smart grids, renewable energy integration, and flexible thermal capacity.

Uttar Pradesh: Projected Per Capita Electricity Consumption and Peak Power Demand (2030–2047)

- **Impact of Data Centers**

If Uttar Pradesh develops 3–5 GW of data center capacity by 2047:

Annual electricity consumption: approximately 25–40 BU

Contribution to total state electricity demand: 4–6%

Major data center hubs are likely to be:

(i)Noida (ii)Greater Noida,

(iii)Lucknow (iv)Kanpur

Which states have grown faster than Uttar Pradesh in the last 15 years?

- When comparing the economies of major Indian states over the last 15 years (approximately 2010–2025), Uttar Pradesh has performed well, but some southern and western states have achieved higher average growth rates.
- Indicative averages based on official GSDP series and state economic survey data

State	Average Annual Real GDP Growth
Tamil Nadu	7-8 %
Karnataka	7-8 %
Gujarat	7-8 %
Uttar Pradesh	5.9%
Maharashtra	5-7%

Which states have grown faster than Uttar Pradesh in the last 15 years?

- Current Growth Performance (FY 2024–25).

State	Real Growth Rate
Tamil Nadu	11.2%
Karnataka	7-8 %
Gujarat	8-9 %
Uttar Pradesh	9.0%
Maharashtra	7%

Which states have grown faster than Uttar Pradesh in the last 15 years?

- Comparison of Economic Size (2025)

State	GSDP (Approx. ₹ Lakh Crore)
Tamil Nadu	31-32
Karnataka	30
Gujarat	28-30
Uttar Pradesh	30.3
Maharashtra	42.7

Key Takeaways for Uttar Pradesh

- Uttar Pradesh's economy expanded from approximately ₹7.2 lakh crore in 2011 to more than ₹30 lakh crore by 2025.
- Between 2012 and 2024, Uttar Pradesh recorded an average real economic growth rate of approximately 5.9% per year.
- On a nominal basis, Uttar Pradesh achieved a CAGR (Compound Annual Growth Rate) of approximately 10.8%.
- By economic size, Uttar Pradesh is now among the top three state economies in India and is rapidly moving toward the second position.

Over the last 15 years, Tamil Nadu, Karnataka, and Gujarat have generally grown faster than Uttar Pradesh in terms of average real GDP growth. However, Uttar Pradesh has significantly accelerated in recent years and is now one of India's largest and fastest-growing state economies. Its economic size has increased more than fourfold since 2011, making it a major contributor to India's overall growth.

Peak Power Demand in UP

STU Plan (FY 2026-27 to FY 2030-31 based on a 6% CAGR from the actual demand of FY 2025-26 (i.e. 31,486 MW)

FY	2025-26	2026-27	2027-28	2028-29	2029-30	Up to 2035-36	Upto 2046-47
Peak Demand of UP Discoms. (MW)	31,486	33,300	35,200	37,200	39,300	56,400	132000
Power Demand(MW) of IMLC & Awas Vikas LDA	-	-	389	1809	661	1600	3000
Peak Power Demand (MW)	31,486	33,300	35,589	39,009	39,961	58000	135000

- Peak load of FY 2025-26 is 31,486 MW.

Peak Power Demand in UP in last 15yrs

UP STATE LOAD DISPATCH CENTRE LIMITED



Year wise Max & Min Demand Met (MW) For Last 15 Years

Financial Year	Maximum Load met (MW)	Date And Time of Max Demand	Minimum Load met (MW)	Time & Date of Min Demand
2012-13	12048	22-06-2012, 04:00	5477	16-02-2013 04:00
2013-14	12327	03-11-2013 , 19:00	4790	18-01-2014, 05:00
2014-15	13003	23-10-2014, 21:00	6199	02-03-2015, 05:00
2015-16	14503	11-11-2015, 20:00	6511	12-07-2015, 08:00
2016-17	16110	31-03-2017, 21:00	5450	29-05-2016, 04:00

Peak Power Demand in UP in last 15yrs

2017-18	18061	23-06-2017, 23:00	6030	10-04-2017, 14:00
2018-19	20062	16-06-2018, 21:00	6503	13-05-2018, 23:00
2019-20	21632	12-08-2019, 22:00	4341	13-12-2019, 04:00
2020-21	23867	16-09-2020, 22:00	6003	02-04-2020, 16:00
2021-22	25071	16-07-2021, 23:55	5662	20-05-2021, 07:00
2022-23	26589	09-09-2022, 21:39	7033	25-10-2022, 17:12

Peak Power Demand in UP in last 15yrs

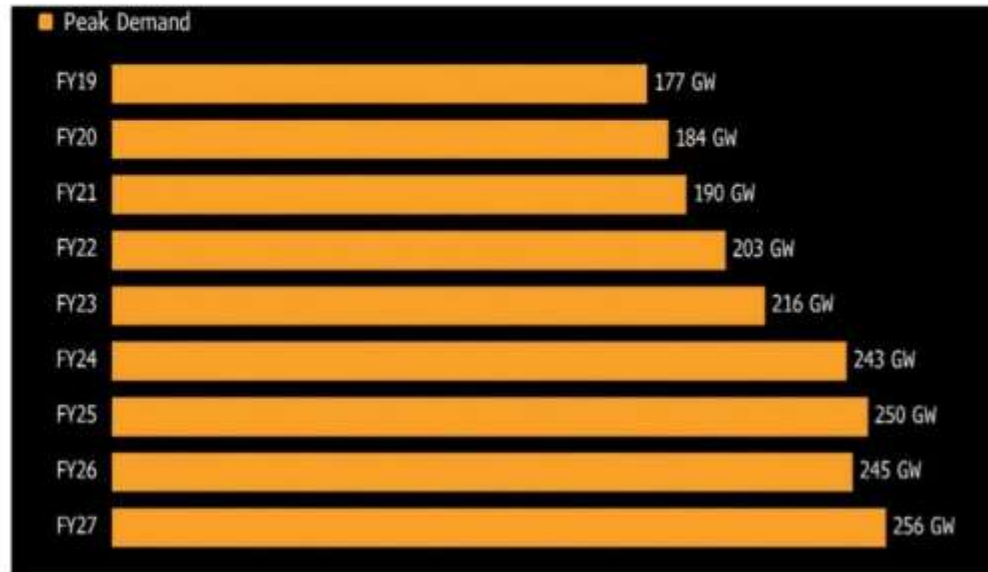
2023-24	28284	24-07-2023, 21:43	7565	03-03-2024, 03:49
2024-25	30618	13-06-2024, 22:00	8378	05-03-2025, 13:14
2025-26	31486	11-06-2025, 00:45	9841	16-11-2025, 07:33

Note: As on 24 May 2026 , Max Demand met was **31824 MW** at 22:29hrs

India's Peak Power Demand

India's Power Demand Touches A New Peak

Scorching Summer Is Pushing Consumption In The Country



Central Electricity Authority – India, Bloomberg, FY27 peak is as on April 25, 2026

Why Such Peak Power Demand in UP

- 1.Expansion of EV charging infrastructure
- 2.More household air-conditioners and cooling appliances
- 3.Growth of expressways and industrial corridors
- 4.Data centers and AI-related infrastructure
- 5.Expansion of metro cities and urbanization
- 6.Rising rural electricity consumption
- 7.Green hydrogen and new manufacturing industries

What will UP need by 2047?

If demand approaches 135 GW (1,35,000 MW), Uttar Pradesh may require:

- 1) 3× expansion in transmission infrastructure
- 2) Large-scale battery energy storage systems
- 3) A balanced mix of solar, nuclear, hydro, wind, biomass and thermal power
- 4) Smart grids and demand-management systems
- 5) Strong interstate & intrastate power transmission corridors
- 6) Hydrogen based power generations (Green energy)

Abbreviation

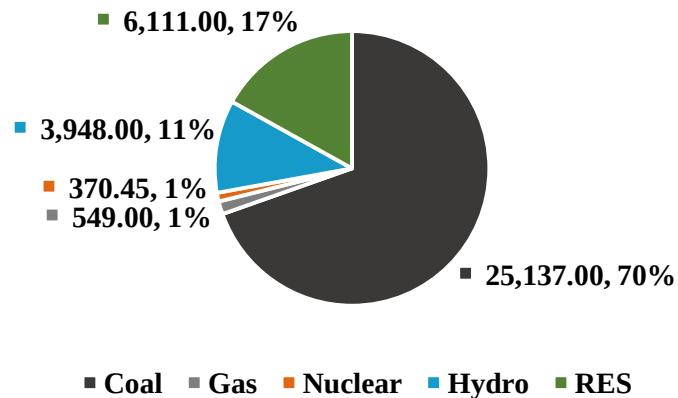
NTPC	National Thermal Power Corporation
NHPC	National Hydro Power Corporation
IMLC	Integrated Manufacturing and Logistic Cluster
FDRE	Firm and Dispatchable Renewable Energy
SECI	Solar Energy Corporation of India Limited
MSW	Municipal Solid Waste
HEP	Hydro Electric Power
BESS	Battery Energy Storage System
SJVN	Satluj Jal Vidut Nigam Limited
RES	Renewable Energy Sources
Slop	Generating green electricity from distillery waste (vinasse/slop) through slop-fired boilers, mainly under waste-to-energy projects
NVVN	NTPC Vidyut Vyapar Nigam Limited
PM-KUSUM	Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan
UPNEDA	Uttar Pradesh New and Renewable Energy Development Agency
PPA	Power Purchase Agreement
PSP	Pump Storage Plants
PSA	Power Supply Agreement
LDA	Lucknow Development Authority
TC	Transmission Central
TNE	Transmission North East
TSC	Transmission South Central
TSE	Transmission South East
TSW	Transmission South West
TW	Transmission West

Existing Generation Capacity of U.P.

- The overall Commissioned generating capacity in the state of Uttar Pradesh as on March, 2026 is 36,116 MW.

Resource	Commissioned generating capacity (MW)
Coal	<u>25,137</u>
Gas	<u>549</u>
Nuclear	<u>370</u>
Hydro	<u>3,948</u>
RES	<u>6,111</u>
Total	<u>36,116</u>

Installed Generating Capacity (MW)



Present Contracted/commissioned Capacity of U.P.(in MW)

Source	Thermal	Wind	Hydro	Solar	Bagasse/ Biomass/ Slop/MSW	BESS (NVVN)	Nuclear	Gas	Total
Contracted capacity (MW)	30651.78 (53.39%)	6345.27 (11.05%)	5259.82 (9.16%)	12389.1 (21.58%)	1512.31 (2.63%)	250 (0.44)	451.44 (0.79%)	548.63 (0.96%)	57,408.35
Commissioned capacity (MW)	25136.96 (69.60%)	1676.40 (4.64%)	3948.32 (10.93%)	2936.70 (8.13%)	1498.31 (4.15%)	0 (0%)	370.46 (1.03%)	548.63 (1.52%)	36,115.78

Note-

Solar Contracted Capacity breakup:- 8094.00 (Pure Solar) + 1673.30 (KUSUM C2 Ph-II) + 34.8 (KUSUM C2 Ph-I) + 1 (KUSUM- A) + 2406 (FDRE) + 180 (Hybrid) = **12389.1 MW**

Wind Contracted Capacity breakup: - 4621.27 (Pure Wind) + 1604 (FDRE) + 120 (Hybrid)= **6345.27 MW**

FDRE Contracted Contracted Capacity (4010 MW) :-

- Solar category considered: 2406 MW (60% of FDRE Contracted Capacity)
- Wind category considered: 1604 MW (40% of FDRE Contracted Capacity)

Wind-Solar Hybrid Contracted Contracted Capacity 300 MW:-

- Solar category considered: 180 MW (60% of Wind-Solar Hybrid Contracted Capacity)
- Wind category considered: 120 MW (40% of Wind-Solar Hybrid Contracted Capacity)

Summary of Future Capacity addition (FY 2026-27 to 2035-36 & projected upto 2047)

Sl. No .	Source	Quantum (MW)	Firm Name	Capacity (MW)	PPA Signed Date	Projected upto 2047
1	Solar	5140	NHPC	1525	07.03.2024	40-50 GW
			SECI	1500	1000 MW PPA date 28.12.2023 500 MW PPA date 07.02.2024	
			Adani Renewable Energy holding	400	03.05.2025	
			ReNew Solar Pvt. Ltd	300	06.05.2025	
			NTPC	1000	04.06.2025	
			MB Power Ltd	300	16.07.2025	
			Kanpur Solar Park	110	16.01.2026	

Summary of Future Capacity addition (FY 2026-27 to 2035-36 & projected upto 2047)

Sl. No.	Source	Quantum (MW)	Firm Name	Capacity (MW)	PPA Signed Date	Projected upto 2047
2	Wind	1775	SECI (Tranche-XIV)	1175	30.05.2024	6-8 GW
			SECI (Tranche-XIX)	600	30.03.2026	
3	FDRE	4010	NHPC	1280	27.11.2024	20-22 GW
			SJVN	1200	20.02.2025	
			NTPC	1530	11.04.2025	
4	Wind-Solar Hybrid	300	Wind-Solar Hybrid	300	21.06.2025	3-5 GW

Summary of Future Capacity addition (FY 2026-27 to 2035-36 & projected upto 2047)

Sl. No.	Source	Quantum (MW)	Capacity (MW)	PPA Signed Date	Projected upto 2047
5	Hydro	7500	4000 MW under bidding		10-12 GW
			742 MW PPA, out of 5600 MW installed capacity of Central Hydro Plants, signed. Plant wise Capacity allocated is as below:-		
			a. Kiru HEP– 84 MW	29.07.2024	
			b. Dibang HEP– 385 MW	29.07.2024	
			c. Sawalkot HEP– 241 MW	29.07.2024	
			d. Uri-I Stage-II– 51 MW	29.07.2024	
			e. 456 MW PPA, from 1200 MW of Kalai HEP, signed. (Allocation Awaited)		

Summary of Future Capacity addition (FY 2026-27 to 2035-36 & projected upto 2047)

Sl. No.	Source	Quantum (MW)	Capacity (MW)	PPA Signed Date	Projected upto 2047
6	Pump Storage Plant	5250	· 2750 MW PPA signed.	23.04.2025	18 GW
				30.04.2025	
			· 2500 MW – Under process.		
7	Thermal	10600	· 3200 MW MoU signed.		15 GW
			· 1800 MW PPA signed.	07.12.2024	
			· 1600 MW Bid process is completed and PPA is signed on 16.05.2025	16.05.2025	
			· 4000 MW Tender has been uploaded.		

Summary of Future Capacity addition (FY 2026-27 to 2035-36 & projected upto 2047)

Sl. No.	Source	Quantum (MW)	Capacity (MW)	Projected upto 2047
8	Source Agnostic	5000	1000 MW – Bidding under process. (Medium term)	15-18 GW
			· 2000 MW – Bidding under process. (Long term)	
			· 2000 MW – Bidding under process (Long term)	
9	BESS	625 MW/2500 MWh	· PPA signed for the procurement of 375 MW/1500 MWh of Battery Energy Storage System (BESS) to M/s SJVN Ltd. on dated 15.07.2025.	5 GW /20 GWh
			· PPA signed for procurement of 250 MW/1000 MWh to NVVN.	
10	Kusum C2 Phase – II	1673.30 MW	PPA signed.	
Total		41873.3 MW		135-150 GW

GEC II Updates

Annexure A

Uttar Pradesh Power Transmission Corporation Ltd. (UPPTCL)

Sl. No.	Name of the Substations (Under GEC-II)	Voltage Level (kV)	Energised/Anticipited COD
Energised Substations			Date of Energization
1	Garautha, Jhansi	400/220	17.03.2026
2	Maheba, Jalaun	400/220/132	27.02.2026
3	Gohand, Hamirpur	132/33	30.09.2025
4	Kuthond, Jalaun	132/33	11.09.2025
5	Kadaura, Jalaun	132/33	23.09.2025
6	Baberu, Banda	132/33	16.04.2026
7	Muskara, (Hamirpur)	132/33	01.03.2026

GEC II Updates

Substations awaited for Commissioning & Energization			Anticipited COD
8	Charkhari, Mahoba	220/132/33	30.06.26
9	Jaitpur, Mahoba	220/132/33	30.06.26
10	Farrukhabad	400/220/132	31.05.26
11	Birdha, Lalitpur	220/132/33	31.05.26
12	Madawra, Lalitpur	220/132/33	30.06.26
13	Kabrai, Mahoba	220/132/33	31.05.26
14	Dakaur, Jalaun	220/132/33	31.05.26

GEC II Updates

15	Bangra, Jhansi	220/132/33	31.05.26
16	Bamaur, Jhansi	220/132/33	31.05.26
17	Hamirpur	220/132/33	30.06.26
18	Mehrauni, Lalitpur	132/33	31.05.26
19	Banda Extn.	220/132	30.06.26
20	Talbehat, Lalitpur	765/400/220	31.01.27
21	Chitrakoot	400/220	31.01.28

Upcoming 8050 MW power(4,600MW Solar & 3,450MW PSP) under GEC-III

UPNEDA has intimated the following capacity planed for solar plants & UPPCL has informed for PSP for which evacuation system is to be developed by FY 2030-31

S. No.	Scheme Type	Plant Capacity (in MW)	Expected Transmission Project cost (in Cr.)
A	Solar Plant	4,600	2,641
B	Pump Storage Plan (PSP)	3,450	2,095
Total		8,050	4,736

Summary of Transmission Network under GEC-III

Total	765 kV	400 kV	220 kV	132 kV	Total
No. of SS	1	1	0	0	2
Line Length (kM)	110	340	589	72	1,111
Capacity (MVA)	6,000+1500	1,000+2,500	2,120	0	7,000+6,120

1 nos. 765kV Mirzapur pooling S/s and 1 Nos. 400kV Renukoot Hindalco S/s.

Summary of Existing Transmission Substation up-to FY 2025-26

Voltage Level/ Zone	132	220	400	765	Total
TC	104	41	8	1	154
TNE	59	14	5	0	78
TSC	28	8	4	0	40
TSE	82	20	5	0	107
TSW	82	34	6	2	124
TW	134	55	16	4	209
Total	489	172	44	7	712

Year on Year 2026-2031 Substations

FY	132 kV	220 kV	400 kV	765 kV	Total YoY
2026-27	6	8	2	1	17
2027-28	23	13	2	0	38
2028-29	11	23	4	0	38
2029-30	9	11	9	3	32
2030-31	6	8	4	0	18
Total	55	63	21	4	143

Year on Year 2031-2036 Substations

FY	132 kV	220 kV	400 kV	765 kV	Total YoY
2031-32	16	7	2	0	25
2032-33	16	6	2	1	25
2033-34	16	7	3	1	27
2034-35	16	6	2	1	25
2035-36	17	6	2	1	26
Total	81	32	11	4	128
Grand Total (FY 2026-27 to-2035-36)	136	95	32	8	271

Year on Year 2036-2041 Substations

FY	132 kV	220 kV	400 kV	765 kV	Total YoY
2036-37	11	8	2	1	22
2037-38	12	7	3	1	23
2038-39	10	9	2	1	22
2039-40	10	8	2	1	21
2040-41	11	8	2	1	22
Total	54	40	11	5	110

Year on Year 2041-2047 Substations

FY	132 kV	220 kV	400 kV	765 kV	Total YoY
2041-42	12	7	2	1	22
2042-43	8	6	2	1	17
2043-44	11	7	3	1	22
2044-45	10	6	2	1	19
2045-46	17	6	2	1	26
2046-47	12	5	1	1	19
Total	70	37	12	6	125
Grand Total (FY 2036-37 to-2046-47)	124	77	23	11	235

Summary of Cumulative Transmission Substation up-to FY 2046-47

FY	132 kV	220 kV	400 kV	765 kV	Total YoY
Upto 2025-26	489	172	44	7	712
Upto 2035-36	625	267	76	15	983
Upto 2046-47	749	344	99	26	1218

Summary of Year on Year Planned Transmission Network Up-to FY 2028-29

FY	Particulars	132 kV	220 kV	400 kV	765 kV	Total YoY	Cumulative
2025-26	No. of Substation	11	10	5	0	26	712
	Capacity (MVA)	1,781	3,000	5,185	0	9,966	2,09,313
	Line Length (Ckt. Km)	659.73	822.12	33.70	575.00	2,090.55	62,160.36
2026-27	No. of Substation	6	8	2	1	17	729
	Capacity (MVA)	8,771	6,360	6,130	1,500	22,761	2,32,074
	Line Length (Ckt. Km)	1,925.02	960.28	760.40	37.00	3,682.70	65,843.06
2027-28	No. of Substation	23	13	2	0	38	767
	Capacity (MVA)	5,305	5,900	2,760	0	13,965	2,46,039
	Line Length (Ckt. Km)	1,889.66	1,185.77	380.00	0.00	3,455.43	69,298.49
2028-29	No. of Substation	11	23	4	0	38	805
	Capacity (MVA)	2,027	8,400	4,000	0	14,427	2,60,466
	Line Length (Ckt. Km)	120.00	1,099.00	234.00	0.00	1,453.00	70,751.49

Summary of Year on Year Planned Transmission Network Up-to FY 2031-36

FY	Particulars	132 kV	220 kV	400 kV	765 kV	Total YoY	Cumulative
2029-30	No. of Substation	9	11	9	3	32	837
	Capacity (MVA)	3,244	5,520	9,000	9,000	26,764	2,87,230
	Line Length (Ckt. Km)	303.00	1,047.00	1,186.00	932.00	3,468.00	74,219.49
2030-31	No. of Substation	6	8	4	0	18	855
	Capacity (MVA)	1,086	2,740	4,000	0	7,826	2,95,056
	Line Length (Ckt. Km)	198.00	650.00	410.00	0.00	1,258.00	75,477.49
2031-36	No. of Substation	81	32	11	4	128	983
	Capacity (MVA)	6,480	10,240	14,520	16,000	47,240	3,42,296
	Line Length (Ckt. Km)	4,860	2,560	1,760	1,600	10,780	86,257

Summary of Year on Year Planned Transmission Network Up-to FY 2046-47

FY	Particulars	132 kV	220 kV	400 kV	765 kV	Total YoY	Cumulative
2036-41	No. of Substation	54	40	11	5	110	1093
	Capacity (MVA)	4320	12800	14520	20000	51640	393936
	Line Length (Ckt. Km)	3240	3200	1760	2000	10200	96457
2041-47	No. of Substation	70	37	12	6	125	1218
	Capacity (MVA)	5600	11840	15840	24000	57280	451216
	Line Length (Ckt. Km)	4200	2960	1920	2400	11480	107937

A large orange parallelogram shape is centered on a white background. The parallelogram is tilted, with its top and bottom edges parallel to each other and its left and right edges also parallel to each other, but slanted relative to the horizontal.

Thank You