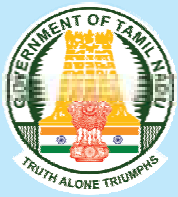

ENERGY DEPARTMENT

POLICY NOTE
2022 - 2023

DEMAND No. 14

V SENTHILBALAJI
Minister for Electricity, Prohibition and Excise

INDEX

VISION

குறள் : 478 ஆகாறு அளவிட்டி தாயினுங் கேடில்லை
போகாறு அகலாக் கடை

Incomings may be scant, it will not cause ruin, if in expenditure you rightly learn to spare

Energy is one of the most critical component for economic growth and welfare of the State. The existence and development of adequate infrastructure is essential for sustained growth of the economy. Tamil Nadu is one of the most Urbanized State in the Country. The State is an Industrial hub and one of the fastest growing State of India. In order to sustain this industrial growth, the Government of Tamil Nadu is taking all efforts for commissioning of the ongoing power projects to bring in energy security. Apart from speeding up the commissioning of all the ongoing conventional projects, Government is taking all out efforts to promote Renewable Energy (RE).

Tamil Nadu is the early achievers of 100% village electrification. The State provides free electricity to Agriculture.

First time ever , the task of providing one lakh agriculture service connections has been achieved in a period of six months, this is the highest number of agriculture service connections ever effected in a year. This scheme was commenced with the inauguration by the Hon'ble Chief Minister of Tamil Nadu on 23.09.2021 at Anna Centenary Library, Chennai and completed on 29.03.2022, with the guidance of the Hon'ble Minister for Electricity, Prohibition and Excise, this mission was accomplished by Tamil Nadu Generation and Distribution Corporation Ltd. (TANGEDCO). Hon'ble Chief Minister of Tamil Nadu on 16.04.2022 issued the service connection sanction order to the final agriculturalist i.e., one lakh beneficiary in the list. Beneficiaries from all the Districts of

Tamil Nadu participated in this function through video conference from 201 locations.

By this scheme, 2.13 lakh acres of agriculture land has been brought under irrigation and a total capacity of 469MW agriculture pumpsets have been connected to the grid, at an expenditure of Rs 803.19 crore to TANGEDCO.

The peak demand for power of Tamil Nadu is 17,000-17,500 MW and the peak demand reached so far in the year 2021-22 is 17,196 MW on 29.03.2022.

During the year 2022, the daily average consumption of Tamil Nadu is likely to be around 340 Million Units (MU) and maximum daily consumption of 375.70 MU was reached 29.03.2022. This is likely to increase to 385 MU during the peak of summer.

The Government of Tamil Nadu is implementing various Mass maintenance

programs to ensure uninterrupted quality power supply.

The Government of Tamil Nadu initiated one more program to identify and improve the Overloaded and Low Voltage Distribution areas. **The Hon'ble Chief Minister of Tamil Nadu inaugurated this scheme on 29.08.2021 at Kolattur constituency** and around 8,905 new Distribution Transformers were identified for erection throughout the State during the year 2021-22. and improvement works for around Rs.743.86 crore were completed on 25.03.2022. This focussed drive to remove overloaded and low voltage pockets were first of its kind.

"Minnagam" a New State Level Centralized Customer Care Centre was launched with Mobile number-**94987 94987** by **the Hon'ble Chief Minister of Tamil Nadu on 20.06.2021,** wherein the consumers can register all complaints related to Power supply. So far 7,21,274 complaints have been received

and 7,19,420 (99.74%) complaints have been closed, after resolving the problem.

Tamil Nadu is the State with highest installed capacity of Renewable Energy (RE) in the Country. The Maximum solar power harnessed was 3,633 MW on 05.03.2022 and the maximum energy generated was 27.2 MU on 01.03.2022. The total Solar power generated during 2021-22 is 7,137.30 MU which is 16.72% higher than 2020-21.

There was a huge power shortage in India during August, September & October 2021 due to availability constraints of coal and high cost of imported coal. Many of the LTOA generators started supplying less power and the cost of power in the power market also peaked. **Despite the above situation, the Government of Tamil Nadu took several steps to maintain uninterrupted power supply to all the consumers in the State.**

Focusing on renewable energy sources, Tamil Nadu is at the forefront of India's renewable energy (RE) transformation. The State government has initiated steps to add 20,000 MW of Solar power generating Stations in the next 10 years.

The Government of Tamil Nadu has signed a memorandum of understanding on 06.09.2021 for Rs.1,32,500 crore with Indian Renewable Energy Development Agency (IREDA), for advisory services in the renewable energy sector. With environmental pollution concerns being raised against thermal plants globally, the Government of Tamil Nadu is keen in investing more on renewable energy sources like Solar, Wind and Hydel in the next five years.

As TANGEDCO is having accumulated loss to the tune of Rs. 1,39,226 crore, the State Government has proposed to take measures such as installation of smart meters, restricting

high-cost power purchase, etc. to increase the revenue and reduce the expenditure. The Government has also initiated discussions with Financial Institutions such as Rural Electrification Corporation (REC), Power Finance Corporation (PFC), Tamil Nadu Power Finance Corporation TNPFC, etc and Commercial Banks to reduce the rate of interest.

Due the continuous efforts **a savings to the tune of Rs. 2,200 crore** have been achieved in TANGEDCO during 2021-22, by various measures viz., improved generation by optimum operation of the existing generating stations, savings due to interest reduction, Sale of Fly ash, Power Swapping arrangements, steps taken to reduce Distribution losses, etc.,.

Further, the Government of Tamil Nadu has made Budget provision of **Rs. 13,108 crore** in the financial year 2022-23, towards taking over of 100% of the losses incurred by TANGEDCO during the financial year i.e. 2021-22. This provision of

funding, **being first in the history of TNEB**, will improve the financial position of TANGEDCO in the financial year 2022-23 .

ENERGY DEPARTMENT

The Energy sector of Tamil Nadu is undergoing a major overhaul under the Government of Tamil Nadu. Some of the important initiatives taken by the Government are increasing the power generation from clean Energy and adoption of latest technologies. TANGEDCO needs to prepare the Grid to accommodate the increasing Renewable Energy from the Generators and prosumers, the transition is more challenging than anticipated. TANGEDCO is taking appropriate action to address this transition.

The use of energy is a key in the development of the Society. Energy is also one of the most critical inputs for economic development. Secure, reliable, affordable and clean energy is fundamental to economic growth and development of the State. Tamil Nadu Energy Policy provides for sustainable power to the

people of the State at reasonable costs. The Government of Tamil Nadu has also initiated various schemes viz., 'Minnagam' an integrated call Center- for easy access , Convenient bill payment, Accurate billing system by implementing ERP etc..

In order to improve the overall performance of TANGEDCO and TANTRANSCO, a detailed Strategic study of the finances and governance structure has been undertaken with ADB funding.

Tamil Nadu Government is committed to provide uninterrupted, reliable and quality power supply to all the consumers at affordable rates. To further this, the Government is taking various steps to improve the financial position of TANGEDCO.

The following organizations are under the administrative control of Energy Department:

I. Erstwhile Tamil Nadu Electricity Board which has been re-organized as, TNEB Limited (Holding company) with the following subsidiary companies

   a) Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) and

   b) Tamil Nadu Transmission Corporation Limited (TANTRANSCO)

II. Tamil Nadu Energy Development Agency (TEDA)

III. Tamil Nadu Electrical Inspectorate (TNEI)

IV. Tamil Nadu Power Finance and Infrastructure Development Corporation Limited (TNPFIDCL)

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1.1 GENERATION

Installed capacity as on 01.04.2022		
Sl. No	**Category**	**Capacity in MW**
I	**Conventional energy sources**	
1.	Thermal Power Stations	4,320.00
2.	Gas Turbine Power Stations	516.08
3.	Central Generating Stations (CGS Shares)	6,972.00
4.	Private Power purchases	
	Independent Power Projects (IPP)	1,105.50
	Long Term Open Access (LTOA)	2,830.00
	Medium Term Open Access (MTOA)	400.00
	Total power purchases	4,335.50
5.	Capitive Power Plants *	508.62
	Total Conventional	**16,652.20**

II	**Renewable Energy Sources**	
1.	State owned Hydro Power Stations	
	Non-Irrigation Hydro Power Stations	1,030.65
	Pumped Storage Hydro Power Stations	400.00
	Irrigation based Hydro Power Stations	891.25
	Total State owned Hydro Power Stations	2,321.90
2.	Wind**	8,615.22
3.	Solar	5,303.50
4.	Bio-mass – combustion	262.59
5.	Co-Generation (Bagasse)	721.90
	Total Renewables	**17,225.11**
	Grand Total	**33,877.31**

* : Open access quantum approved to the Fossil fuel based Captive/Third party generators for wheeling power through TANTRANSCO network to the EHT/HT consumers of TANGEDCO

** : Excluding WEGs connected to Central Transmission Utility (CTU)

As on 01.04.2022, WEGs connected to CTU network – 1,220.19 MW

1.1.1 Tamil Nadu Generation and Distribution Corporation Limited's own Generating Stations

I. Thermal Power Stations

TANGEDCO's five thermal power generating stations namely North Chennai Thermal Power Station-I, North Chennai Thermal Power Station-II, Mettur Thermal Power Station-I, Mettur Thermal Power Station-II & Tuticorin Thermal Power Station, have total installed capacity of 4,320 MW.

Performance of Thermal Stations during the year 2021-22

Plant Load Factor (PLF)

The Plant Load Factor (PLF) is one of the key performance indicators of any power plant and it is commonly considered as a measure of a power plant's capacity utilization. The Plant Load Factor (PLF) and energy generated from TANGEDCO owned thermal stations during the year

2021-22 show increasing trend compared to the previous year (2020-21) as listed below:

Plant Load Factor (%)

S. No.	Name of the Station	PLF for the year (in %)	
		2020-21	2021-22
1.	NCTPS-I (3x210MW)	50.83	61.00
2.	NCTPS-II (2x600MW)	34.76	43.00
3.	MTPS-I (4x210MW)	48.16	65.00
4.	MTPS-II (1x600MW)	26.99	52.58
5.	TTPS (5x210MW)	44.93	53.95

Generation in MU

S. No.	Name of the Station	Generation for the year (in Million Unit (MU))		Increase in MU
		2020-21	2021-22	
1.	NCTPS-I (3x210MW)	2,805.20	3,356.50	551.31
2.	NCTPS-II (2x600MW)	3,653.50	4,512.33	858.83
3.	MTPS-I (4x210MW)	3,544.08	4,796.00	1,251.92
4.	MTPS-II (1x600MW)	1,418.37	2,763.78	1,345.41
5.	TTPS (5x210MW)	4,132.38	4,962.57	830.19
	TOTAL	**15,553.52**	**20,391.18**	**4,837.66**

A) North Chennai Thermal Power Station – I (3 x 210MW)

Significant Achievements

Persistent and close monitoring of the operations of three 210 MW units, Strengthening Coal Mills and attending to the faults in time, all these relentless measures have resulted in an impressive performance of all the Units of the North Chennai Thermal Power Stations. The Unit-I of NCTPS-I was in continuous operation from 02.05.2021 to 24.08.2021 for 113 Days during the financial year 2021-22.

North Chennai Thermal Power Station – I

Way forward to improve overall performance

a. Modular replacement of Flue gas duct to arrest air ingress and Conversion of existing single seal Air Pre-heater into double seal Air Pre-heater is proposed to be carried out which will enable to run the unit at Rated capacity.
b. Providing Air sealing arrangement at Pent House is proposed in Units I & III to run the units at rated capacity.
c. Revamping of Mills is proposed to maximise the generation and reduce the usage of Oil for power generation thereby reducing variable cost.
d. Revamping of Coal Handling System is being carried out for faster discharge from ships.
e. Action is being initiated for establishing Tertiary Treated Reverse Osmosis (TTRO) water for Generation Purpose in North

Chennai Thermal Power Station Stage I & II which will reduce the water cost by 45%, thereby O&M cost will get reduced, thereby will lead to a savings of Rs. 28.32 crore per annum.

B) North Chennai Thermal Power Station– II (2 x 600 MW)

Significant Achievements

The plant has been continuously running and Ash handling problems are resolved. When the Government has taken over, the plant was not functioning due to collapse of ESP hoppers, it was rectified and brought to use.

North Chennai Thermal Power Station – II

Way forward to improve overall performance

a. Electro Static Precipitator (ESP) revamping works in both the Unit I & II are under progress. On completion of the works, generation will be increased.

b. By carrying out the replacement of Electro Chlorination Plant (ECP), apart from increasing the efficiency it is also proposed to increase the generating capacity of the units .

c. Installation of Pressurized Dense Fly Ash Conveying System (PDFACS) for Unit I & II at Rs. 126.87 crore, is proposed to augment the fly ash collection system thereby improving the additional revenue from sale of fly Ash.

C) Mettur Thermal Power Station– I (4x210 MW)

Significant Achievements

a. During the financial year 2021-22, Unit-IV of MTPS-I was in continuous service for more than 50 days for two times due to proper maintenance.

b. During the financial year 2021-22, Unit-I of MTPS-I is in continuous service for 117 days from 22.12.21 to 18.04.2022 due to proper maintenance.

c. The revenue by sale of fly ash for the year 2021-2022 is Rs. 47.82 crore which is higher by Rs. 8.6 crore than previous year 2020-21.

Mettur Thermal Power Station – I

Way forward to improve overall performance

a. Renovation & Modernization of Electro Static Precipitator (ESP) including refurbishment of the existing ESP is under progress.
b. Revamping and performance improvement of existing dry fly ash collection system for Unit IV is proposed to be carried out.
c. Renovation & Modernization of the existing solid-state Furnace Safeguard Supervisory System (FSSS) for the Unit-II is proposed.
d. Installation of Numerical type Generator Protection Relay Panels (GRP) including mandatory spares by adopting new technologies is proposed for Unit-II & III.

D) Mettur Thermal Power Station – II (1 x 600 MW)

Significant Achievements

a. During the Month of June'21, MTPS-II has achieved 100% Plant Availability factor (PAF) with Maximum Generation of 365.81 MU and PLF of 84.68%.

b. Total Ash Generated also increased to 1,04,610.75 MT.

During the Month of June'21, all time high quantity of 78,841 MT of Ash has been sold to Cement companies to generate high revenue of Rs.4.85 crore to TANGEDCO.

Mettur Thermal Power Station – II

Way forward to improve overall performance

Augmentation of ash handling capacity (PDFAC) for the 16 nos. of first two rows of ESP hoppers and conveying to existing R.C.C. Silos at a cost of Rs.51.33 crore and is being proposed to be carried out to improve the plant performance.

The plant was designed for 30 % use of imported coal. Due to use of cheaper Indian coal having more ash, the evicting capacity is required to be increased. This way the plant can be used at full load capacity with both Indian / Imported coal.

E) Tuticorin Thermal Power Station (5x210 MW)

Significant Achievements

a. During this financial year 2021-22 Unit-IV of TTPS is in continuous service for more than 50 days for two times due to replacement of

Hot Re-Heater Coil assembly in Boiler during Annual Overhaul for the year 2021-22.

b. Unit-V of TTPS was in continuous service for 56 days from 09.04.2021 to 05.06.2021 due to proper maintenance.

Way forward to improve overall performance

a. Installation of platen water wall tubes and bends is proposed in Unit-III Boiler during Capital Over Hauling (COH).
b. Installation of Debris filter is proposed in Unit-IV during Capital Over Hauling (COH).
c. Complete replacement of Hot Re-heater assembly in Unit-V Boiler during AOH is proposed to avoid punctures.

Installation of latest Distributed Digital Control Monitoring and Information Systems (DDCMIS) in Unit-III to avoid freakish unit tripping

Tuticorin Thermal Power Station

Combating Pollution in Thermal Power Stations Installation of Flue Gas De-sulphurisation (FGD)

In order to meet the revised environmental norms, it is planned to install Flue Gas De-sulphurisation (FGD) in all five TANGEDCO owned thermal stations at the estimated cost of Rs.2,350 crore. This will reduce Sulphur-di-oxide level in flue gas in all five TANGEDCO owned thermal stations.

Revenue Savings in Fly Ash Management

The revenue generation due to sale of Fly Ash is comparatively higher during 2021-22 than previous year 2020-21. Revenue realized from all Thermal Power Stations through sale of Fly Ash during the year 2021-22 is Rs.120.01 crore.

II. Hydro Power Stations

Tamil Nadu has been a pioneer State in the field of hydro power development in India.

It is the only State in India where all of its economical hydro power potential has been harnessed.

The State has the Kundha hydro power plant with highest head in India and has developed about every possible type of hydro power schemes i.e., run off river & storage based, surface & underground power houses, high head & low head plants, base load & peak load stations, single & multi-purpose plants, conventional & pumped storage plants, stations in cascade development and inter-basin transfer of water for power generation.

At present, 47 numbers of TANGEDCO's own Hydro power stations (107 machines with the total installed capacity of 2,321.90 MW) are functioning in Erode, Kadamparai, Kundah and Tirunelveli hydro generation circles. The power houses are classified into irrigation based (29 Nos. of Power houses with an installed capacity of

891.25 MW), non – irrigation based (17 Nos. of Power houses with an installed capacity of 1030.65 MW) & pumped storage (1 no. of Power house with an installed capacity of 400 MW) power houses.

Further, 76 Nos. of TANGEDCO owned Dams, Saddles, Reservoirs and Barrages are being maintained by TANGEDCO.

The hydel stations meet the peak-hour load and balancing of RE Power. There is deviation between actual and forecasted generation in solar and wind power. In order to meet the gap, hydro power is used. The hydro power, due to its faster starting capacity, is ideal for balancing resources.

Significant Achievements during the year 2021-22

Surpassing the targets set by Central Electricity Authority (CEA)

During the year 2021-22, TANGEDCO has exceeded the annual targets set by the Central

Electricity Authority (CEA) for hydro generation. TANGEDCO has generated around 5,514.10MU, about 1,660.36 MU higher than the target fixed by the CEA for the year 2021-22. The performance of hydro units for the year 2021-22 is tabulated below:

Year	CEA Target in MU	Generation in MU	Plant Availability Factor %	Cost of Generation in Paise
2021-22	3853.74	5514.10	76.37	**58.42**

Power Houses surpassing the previous best generation during the year 2021-22

During the year 2021-22, as a result of periodical preventive maintenance carried out in hydro stations, the maximum availability of machines has been increased. The following power houses of TANGEDCO have reached the highest generation so far surpassing the previous best:

S. No.	Name of the Power House	Previous Highest Generation in MU	Achieved Highest Genera-tion in MU (during 2021-22)	% increased
1	Periyar Power House (4 x 42MW)	703.01 (2018-2019)	**758.39**	7.88
2	Vaigai Power House (2 x 3MW)	27.22 (1994-1995)	**29.69**	9.07
3	Perunchani Mini Power House (2 x 0.65MW)	2.96 (2018-2019)	**5.97**	101.0
4	Periyar Vaigai SHEP I (2 x 2MW)	12.64 (2018-2019)	**15.79**	24.92
5	Periyar Vaigai SHEP II (2 x 1.25MW)	9.26 (2018-2019)	**11.89**	28.4
6	Periyar Vaigai SHEP III (2 x 2MW)	14.27 (2018-2019)	**17.82**	24.87
7	Periyar Vaigai SHEP IV (2 x 1.25MW)	8.54 (2018-2019)	**11.31**	32.43
8	Servalar (1x20MW)	46.61 (1994-1995)	**61.78**	32.55
9	Bavani Kattalai Barrage (BKB) II (2 x 15 MW)	84.59 (2020-21)	**84.70**	0.13
10	BKB III (2x15MW)	62.97 (2020-21)	**68.60**	8.94

Generation achieved more than previous year generation in following power houses

Due to the maximum availability of machines and with the rise in the Irrigation demand, the following power houses have exceeded the previous year generation

Sl. No.	Name of PH	Capacity in MW	Annual Generation in MU	
			2020-21	2021-22
1	Kundah PH.IV	100.00	137.37	183.03
2	Pykara PH	59.20	0.04	0.11
3	Maravakandy Mini PH	0.75	0.21	0.57
4	Punachi PH	2.00	1.57	1.66
5	Sholayar PHI	84.00	237.91	373.96
6	Sarkarpathy PH	30.00	137.29	143.32
7	Amaravathy PH	4.00	7.12	9.35
8	Periyar	168.00	548.03	779.15
9	Vaigai Mini PH	6.00	18.47	29.83
10	Kodayar PHI	60.00	202.58	207.33
11	Perunchani PH	1.30	4.83	6.00
12	Papanasam PH	32.00	131.92	163.36

Sl. No.	Name of PH	Capacity in MW	Annual Generation in MU	
			2020-21	2021-22
13	Servalar PH	20.00	48.13	69.71
14	Periyar Vaigai SHEP I	4.00	11.34	16.30
15	Periyar Vaigai SHEP II	2.50	7.94	12.26
16	Periyar Vaigai SHEP III	4.00	11.91	18.36
17	Periyar Vaigai SHEP IV	2.50	6.82	11.63
18	Mettur Dam PH	50.00	133.83	135.33
19	Mettur Tunnel PH	200.00	337.16	392.47
20	Lower Mettur Barrage PHI/Chekkanur	30.00	75.33	78.84
21	Lower Mettur Barrage PHII/Nerinjipettai	30.00	75.44	77.16
22	Bavani Sagar MHPH	8.00	29.50	45.50
23	Sathanur PH	7.50	4.17	10.17
24	Bhavani Kattalai Barrage PH II	30.00	84.59	84.75

Sl. No.	Name of PH	Capacity in MW	Annual Generation in MU	
			2020-21	2021-22
25	Bhavani Kattalai Barrage PH III	30.00	63.00	68.60
26	Bhavani Barrage 1	10.00	4.10	12.25
	Total	**975.75**	**2320.60**	**2931.00**

Replacement of entire Stator coils in Aliyar Power House

The Aliyar Power House with an installed capacity of 60 MW was commissioned during 1970 and has served more than 50 years. Due to ageing and weak insulation of the Stator coils, the machine could not be used for generating 60 MW.

In order to resolve the issue, the replacement work of entire 540 Stator coils by new coils was carried out at an estimated cost of Rs.4.95 crore and the unit was put back into

service on 22.02.2022. It is noteworthy that the above unit, after rectification, is running at full load capacity of 60 MW and so far, 22.64 MU have been generated, thus yielding a revenue saving of Rs.13.52 crore.

Aliyar Power House

Rectification of Stator Earth Fault in Kodayar Power House - 2

Due to Stator Earth Fault, Kodayar Power House - 2 with an installed capacity of 40 MW failed on 29.08.2021. Rectification works were carried out and the units were put back into service on 22.03.2022. The power house has generated 2.16 MU thereby yielding a revenue saving of Rs. 1.29 crore.

Renovation, Modernization and Up-rating works (RMU) to increase the life period for further 25-30 years

The full load capacity of existing hydro power plants could not be achieved in several stations due to ageing of machines, related mechanical defects and reduced water storage levels. In order to improve the generation capacity of Hydro stations, action has been initiated to undertake renovation, modernization and up-rating works (RMU) in all Hydro Power Stations. Currently, Renovation, Modernization

and Up-rating (RMU) work are under progress at Moyar and Kodayar Hydro Power Stations. Details are tabulated below:

Scheme	Life period served by the Hydro Power House (in years)	Existing Capacity (in MW)	Capacity after RMU (in MW)
Moyar PH	70	3 x 12	3 x 14
Kodayar PH-I	52	1 x 60	1 x 70

DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP-II)

1. This Project envisages rehabilitation and improvement of 27 dams of TANGEDCO at a cost of Rs. 461 crores by availing loan from the World Bank.
2. The Government of India is implementing Dam Rehabilitation and Improvement Project (DRIP-II) with Central Water Commission (CWC) as a nodal agency for the purpose of

Improving the safety and operational performance of Indian dams with the participation of various State Governments/ State Agencies/ Central Agencies. In Tamil Nadu, TANGEDCO, Public Works Department & Agricultural Engineering Department are part of DRIP Phase II as Implementing Agencies.

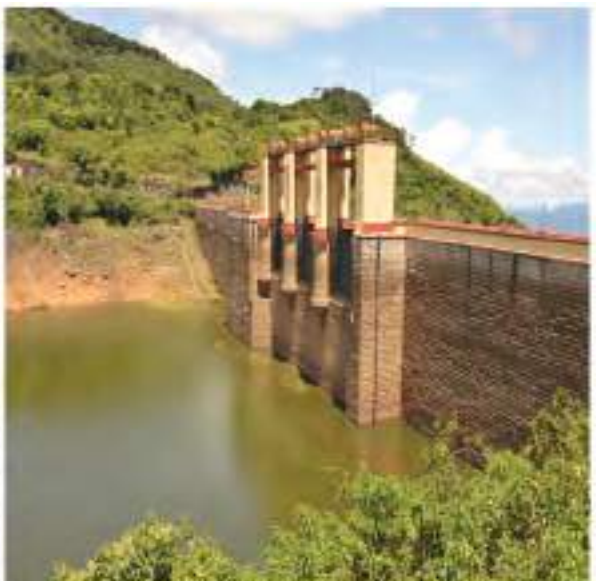
3. The Government of Tamil Nadu has accorded Administrative Sanction.
4. The rehabilitation works in each dam are identified by an Expert panel namely “Dam Safety Review Panel (DSRP)” constituted from the empanelled list of Central Water Commission, the nodal agency for this project, consisting of Experts from various fields.
5. The nature of works recommended by DSRP team generally relates to strengthening the structural integrity of the dam including seepage control measures, structural safety

measures, improvement to energy dissipation arrangement, Desilting of reservoirs, improving all the infrastructure associated with the maintenance of dams.

6. Based on the recommendations of DSRP, proposals for rehabilitation works are prepared and sent to the World Bank through CWC for approval. On receipt of approval, tenders are floated in accordance with the Procurement Guidelines of the World Bank through National Level Competitive Bidding.

7. Sofar, the works in 11 dams have been awarded and the works are under progress. The works in remaining dams will be taken up and completed within the DRIP II period.

KUNDAH PALAM DAM - NILGIRIS DISTRICT



MANALAR DAM - THENI DISTRICT

III. Gas Turbine Power Station

In Gas turbine power stations, Electricity is produced in the Generator driven by Gas turbines using Natural Gas as fuel. The Gas Turbine Stations of TANGEDCO are generating power as per the availability of natural gas being supplied by M/s. Gas Authority of India Ltd (M/s. GAIL).

A) Valuthur Gas Turbine Power Station

This Power Station holds the record of power generation higher than the target fixed by Central Electricity Authority (CEA) at a less cost compared to thermal plants, which is a milestone for TANGEDCO in power generation.

i. Valuthur Gas Turbine Power Station– Phase I (95 MW)

The major inspection of the gas turbine was completed in July 2021 with installation of advance gas path parts. By this, the generation

got increased by 2 MW. Additional Generation of 0.04 MU per day is realised for the past eight months with a saving of around Rs. 6 crore.

ii. Valuthur Gas Turbine Power Station-Phase II (92.2 MW)

In order to improve the generation, major inspection works have been proposed in June 22. Orders have been issued to procure new parts and to repair certain parts from M/s. Ansaldo, Italy, the original equipment manufacturer of the Gas Turbine. Skilled and technically expert persons will be visiting from Italy for carrying out Major Inspection. This will improve the plant load by another 15 – 20 MW in future.

Valuthur Gas Turbine Power Station

B) Kuttalam Gas Turbine Power Station (101 MW)

Due to the short supply of gas, the unit is being operated at part load. On the repeated request made by TANGEDCO, additional quantity of 1,05,000 SCMD (Standard Cubic Meters Per Day) natural gas has been allotted by M/s. GAIL from August 2021 onwards. The repairing of Steam Turbine Generator (STG) Stator is under progress and all efforts are being taken to complete the works as per the schedule. On completion of the above works, an additional 15 MW will be generated by the Steam Turbine Generator (STG) from April 2022 onwards.

C) Thirumakottai (Kovilkalappal) Gas Turbine Power Station [T(K)GTPS -107.88MW]

Due to continuous follow up of TANGEDCO, the gas supply from M/s. GAIL has been improved to 1,96,000 SCMD from 1,30,000 SCMD from October 2021 onwards. The Steam Turbine Generator is brought into service from 19.03.2022

after partial replacement of choked condenser tubes.

M/s. Indian Oil Corporation Limited (IOCL) are laying Re-gasified Liquefied Natural Gas (R-LNG) pipelines from Ennore to Tuticorin. Additional natural gas from Madhanam gas field by M/s. GAIL or R-LNG by M/s.IOCL can be availed after completion of new gas pipe lines. Government of Tamil Nadu has declared the Delta districts as Agricultural Protection Zone. However, conversion to R-LNG is required for balancing of solar power.

D) Basin Bridge Gas Turbine Power Station (120 MW -4X30MW)

The cost of generation works out to Rs.30 per KWhr as per the present market price of Naphtha. Normally, 2-3 Units are being operated on condenser mode to improve the voltage (110 kV) of Chennai network. During emergency situations, the plant is operated in generation

mode and produce electricity. The possibility of converting the fuel from Naphtha to Re-gasified Liquefied Natural Gas is being studied so as to run the Plant with lesser variable cost.

Way Forward

Efforts are being taken to carry out the following mandatory Inspections in time to ensure maximum generation and to avoid any outages:

a. Valuthur GTPS-I – Combustion Chamber Inspection for 7 days in November 2022.
b. Valuthur GTPS-II – Major Inspection and maintenance of equipments for 45 days in June 2022.
c. Kuttalam GTPS - Combustion Chamber Inspection for 7 Days in June 2022.
d. Thirumakottai (Kovilkalappal) GTPS - On receipt of confirmation on full gas supply from M/s. GAIL, Major Inspection will be carried out.

IV. Allocation of Power from Central Generating Stations

Long term power purchase agreements have been executed based on the allocation of share of power by Central Generating Stations by Ministry of Power in order to meet the demand.

Sl.No	Central Generating Stations	Share (in MW)
1	Ramagundam Stage I & II	524
2	Ramagundam Stage III	131
3	Talcher Stage II	496
4	Simhadri Stage II	224
5	Kudgi Units I, II & III	346
6	NTECL - Vallur Units - I,	1064
7	BARH-I	80
8	BARH-II	97
9	KBUNL (MTPSII)	88
10	NLC TS-II Stage – I	240
11	NLC TS-II Stage – II	378

Sl.No	Central Generating Stations	Share (in MW)
12	NLC TPS Expansion – I	226
13	NLC TPS Expansion – II	270
14	New Neyveli TPS	655
15	NTPL – Tuticorin Units I &	411
16	MAPS	331
17	KAPS – Units I & II	119
18	KAPS – Units III & IV	105
19	KKNPP – Unit I	589
20	KKNPP – Unit II	563
21	Eastern Region	35
	TOTAL	**6,972**

Further, additional 140 MW is being allocated from NTPC/ Bongaigaon (received from 10.04.2022) since 10.04.2022 under CGS share

Apart from this, in order to meet the summer demand, additional power procurement of 554.67 MW was availed from NLC and NTPC Stations based on power surrendered by other

state entities for 5 years and reallocated by MoP vide its letter dated 28.03.2022.

V. Power Purchase

A) Medium Term Open Access (MTOA)

As per the announcement made on the floor of Assembly on 07.09.2021, “Purchase of Power at a cheaper rate of Rs. 3.26 per unit under Medium Term Open Access (MTOA) for 1,500 MW for a contract of 3 years, TANGEDCO had executed Power Supply Agreement (PSA) with M/s. PTC India Ltd on 22.10.2021 for the supply of 400 MW Round the Clock (RTC) power under MTOA for a period of 3 years at the rate of Rs.3.26 per KWhr. Out of which, 150 MW power is now being received and due to the non availability of coal, the balance quantum is expected from May 2022.

Further, TANGEDCO had floated a Medium Term Tender for procurement of 1500 MW RTC

power for a period of 5 years from 01.04.2022 appointing M/s. PTC as an Aggregator. The tariff discovered was Rs.4.04 / unit at the interconnection point and Rs.4.66 / unit including transmission charges and losses. TANGEDCO has issued letter of award to four successful bidders for 627 MW and signing of agreement is in process.

In the presence of the Hon' ble Chief Minister of Tamil Nadu, TANGEDCO signed an agreement for procurement of 400MW Solar Power from M/s. Power Trading Corporation Limited on 16.03.2022

B) Short Term Open Access (STOA)

As per the announcement made on the floor of Assembly on 07.09.2021, “Purchase of power through Short Term Open Access to maintain un-interrupted power supply and to meet the evening peak demand & full-time summer demand”

In accordance with the above announcement, TANGEDCO has finalized the procurement of following RTC power under short term tender.

Round the Clock (RTC) Power	Period
525 MW	01.03.2022 to 13.03.2022
765 MW	14.03.2022 to 31.03.2022
965 MW	April 2022
925 MW	01.05.22 to 20.05.22

Further, to cater the demand, power is being procured from Exchange under Day ahead Market (DAM), Term ahead Market (TAM) and Real Time Market (RTM) .

C) Swap power arrangement

The swap power arrangements are energy transactions between two utilities without monetary considerations.

As per the announcement made on the floor of Assembly, “Supplying the excess power during wind season to the required States and to get back the same during summer under SWAP arrangement will be actively implemented”.

TANGEDCO receives power from other State utilities during peak summer of February to May and returns the surplus power of TANGEDCO during the wind season of June to August.

In consonance with the above, TANGEDCO has so far received 100 MW RTC Power in Januarary 2022, 200 MW only during the evening

peak hours in February 2022 & 585 MW RTC Power in March 2022 and arranged to receive 260 MW RTC Power for April 2022 & May 2022 under swap arrangements.

VI. Renewable Energy

Tamil Nadu stands first in the country in respect of Renewable Energy with an Installed capacity of 17,225.11 MW.

The Renewable Energy capacity have been increased by 849.52 MW during the year 2021-22 compared to the increase of only 504.3 MW during the year 2020-2021 with an increase of 68.46%.

A) Wind Energy

The State of Tamil Nadu has the highest installed wind capacity of 8,615.22 MW accounting for 25 per cent of the nation's wind power capacity. The capacity addition achieved during this year is 49.32 MW.

Biggest Wind Mill of India in Tamil Nadu

As on date a Wind Generating machine with a highest capacity of 4.2 MW, WEG make with a Hub height 120-meter, Rotor dia of 147 meter is under construction in Vadakku Valliyur Village, Radhapuram Taluk, Tirunelveli District, by a private sector and expected to be commissioned shortly.

Re-powering of TANGEDCO Wind Mills

His Excellency the Governor of Tamil Nadu, during the Governor's Address 2021-22, on the floor of Assembly, has announced, "Promoting renewable energy including re-energisation of old and inefficient windmills" of TANGEDCO.

In consonance with the above announcement, it is programmed to undertake replacement of the old 110 numbers of Wind Energy Generators operating since the year 1986 with a total installed capacity of 17.46 MW with

the latest Technology at an estimated cost of Rs.120 crore.

So far the private Wind Power Generators in Tamil Nadu had repowered their 47 Nos. of Old outdated technology WEGs with a total capacity of 13.265 MW by 36 Nos. of new updated technology Wind Energy generators.

B) Solar Energy

With an installed capacity of 5,303.50 MW, Tamil Nadu stands fourth in India. This year, 792.20 MW of additional solar capacity (both in Rooftop solar and utility scale) has been installed in Tamil Nadu from 01.04.2021. The all-time high generation of solar power peak of 3,633 MW on 05.03.2022 and generation of 27.2 million units realized on 01.03.2022. Further the State has realized 6,436.71 million units of solar energy from solar energy generators during the year 2021-22.

Solar Power Park Establishment

With an objective to meet out the growing demand of electricity, to reduce the purchase of energy at higher rate from the private developers, to meet the Renewable Purchase Obligation (RPO) and to promote sustainable Renewable energy growth in the Tamil Nadu, Hon'ble Minister for Electricity, Prohibition and Excise has announced that TANGEDCO will initiate measures to set up 20,000 MW of solar energy power stations across a period of 10 years. At first instant, to establish Solar energy power stations of capacity 4,000 MW approximately and 2,000 MW of battery energy storage systems across the State. For implementation of the above project, a consultant has been appointed for preparation of Detailed Project Report (DPR).

Further, identification of lands in districts for erection of solar power plants is under progress.

Power Sale Agreement with Solar Energy Corporation India for procurement of 1000 MW

TANGEDCO has signed a Power Sale Agreement on 16.09.2021 with Solar Energy Corporation of India for procurement of 1,000 MW of solar power at the rate of Rs.2.61 per unit under Manufacturing Linked ISTS scheme to meet TANGEDCO's RPO requirement.

In the presence of the Hon' ble Chief Minister of Tamil Nadu, TANGEDCO signed an agreement for procurement of 1000MW Solar Power from SECI on 16.03.2022

C) Co-generation Plants in Co-operative and Public Sector Sugar mills

TANGEDCO has taken up establishment of 12 nos. of Co-generation plants in 10 nos. Co-operative and 2 nos. of Public Sector sugar mills along with sugar mill modernization in Tamil Nadu.

The total Cost of the Project is Rs.1,241.15 crore for a total Capacity of 183 MW and exportable Power to the State Grid is 120.11 MW.

Contract has been executed between TANGEDCO and M/s. Walchand Industries Ltd., Pune (WIL) on 20.02.2010 for establishment of the above for a total Contract value of Rs.1,125.63 crore on Engineering, Procurement & Construction (EPC) basis.

Description	Nos.	Capacity in MW
Co-generation Projects	12	183 MW
Completed Projects	6	93 MW

The balance Co-generation Projects are expected to be commissioned during this year.

D) Action Plan to achieve Solar Renewable Purchase Obligation (RPO)

a. Procurement of solar power under Component-A of PM-KUSUM scheme - tender finalised for 3MW and approval of Hon'ble TNERC is awaited for issue of LOA and draft PPA.

b. TANGEDCO signed Power Sale Agreement with M/s SECI and TANGEDCO for purchase of power from **500 MW** SPV at Rs. 2.78 per unit and the 500MW is to be supplied by the following solar power generators to the State Grid.

i. M/s. Avaada Sustainable RJ Project Private Limited – 160 MW,
ii. M/s. Masaya Solar Energy Private Limited – 170MW and
iii. M/s. ReNew Solar Urja Private Limited – 170MW.

Consent for scheduling has been given to M/s. Avaada Sustainable RJ Project Private Limited for 60 MW which is being received from 13.04.2022 and M/s. ReNew Solar Urja Private Limited for 170MW which is expected by end of this month

c. MOU signed for Solarisation of Agricultural feeder by installing **50 MW** SPV plants by M/s SECI on pilot basis.

d. Establishment of Solar energy power stations of capacity **4,000 MW** approximately and 2,000 MW of battery energy storage systems across the State.

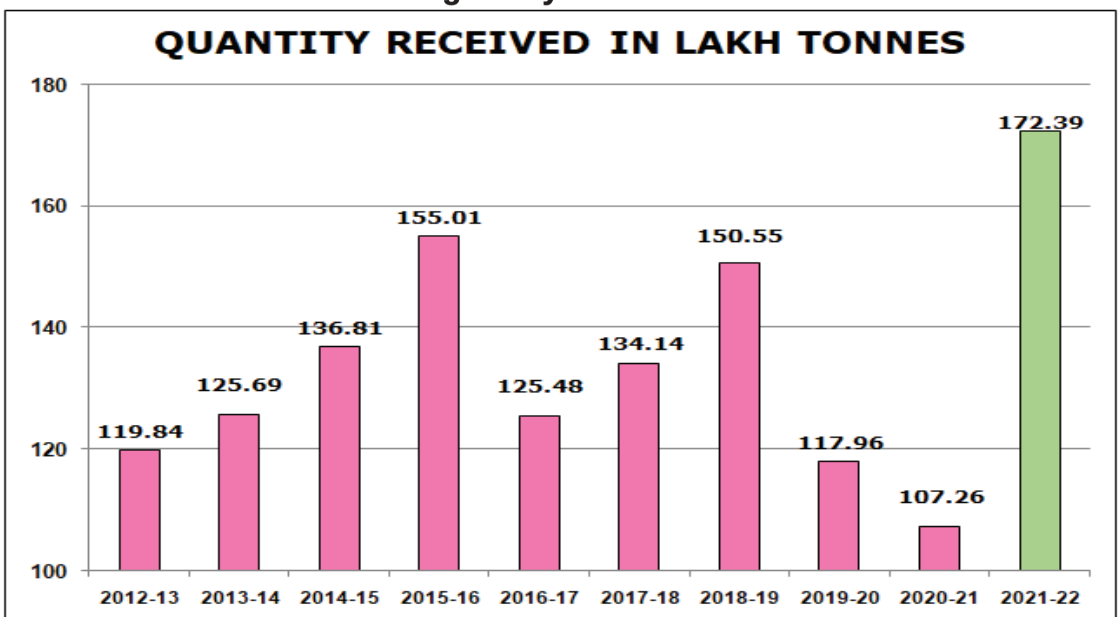
VII. Coal

A. Coal to TANGEDCO

The Annual requirement of coal for existing TANGEDCO's Thermal Power Stations (Total capacity 4,320 MW) @100% Plant Load factor (PLF) is 26.28 MTPA (Million Tonnes Per Annum). Indian Coal is procured from Mahanadi Coalfields Ltd (MCL) through Fuel Supply Agreement (FSA) with a linkage of 19.563 MTPA and Singareni Collieries Company Limited (SCCL) through Memorandum of Understanding (MOU) for a quantity of 4 MTPA with a total quantity of 23.563 MTPA.

India
WEST BENG
Ranchi
CHHATTISGARH
IB Valley
Raipur
JDISHA
Balan
Puri
Paradeep
Odisha
Visakhapatnam
Andhra Pradesh
ANGANA

Highest Receipt of Domestic coal in 10 years during the year 2021-22



This year 2021-22 has recorded the highest receipt of coal from mines since past 10 years.

Presently tender for movement of 2 lakh tones of coal from ECL mine end to discharge port (Ennore port/ Karaikal port) has been opened and is under process.

B. Coal Quality Assurance Wing

TANGEDCO proposes to form a separate Coal Quality Assurance Wing. The sampling and quality of coal will be ensured at mine end, port end and at power station by engaging reputed testing agencies or research organization.

Import Coal

During the month of February and March 2022, in spite of all the efforts taken to improve the realization of domestic coal, supply of domestic coal is only 12.4 rakes per day. To run all the plants 20 to 22 rakes / day of coal is required.

Therefore, to meet the peak summer demand and to maintain continuous generation, TANGEDCO has floated Global tender to procure 4.8 Lakh tonnes of imported steam coal of any origin of Gross Calorific Value (GCV) 5000 Gross As Received (GAR) through Open Tender (e-tender) with e-reverse auction to be delivered in the month of May'22 and June'22.

C. Short supply of Railway rakes

Out of 22 rakes possible for transportation, TANGEDCO has been allocated only 12 rakes against the allotment of 16 rakes / day.

Operational issues and solution during coal handling at various ports

(i) The total capacity to load coal at MCL sidings for Paradip Port is only 32 rakes per day. This network is shared by 7 utilities and requirement of rakes for all these utilities is 40 rakes/ day. This may increase to 56 rakes per day due to upcoming projects viz., North

Chennai Thermal Power Plant Stage III, Ennore SEZ TPP, ETPS Expansion TPP and Udangudi Thermal Power Project Stage I of TANGEDCO.

(ii) The additional coal requirement for upcoming projects is 16 rakes/day Hence, the requirement of TANGEDCO will increase to 38 rakes/ day from the year 2025 onwards. So the existing capacity of 22 rakes/day will not be sufficient to meet the requirement. Hence Railway network in MCL siding to Paradip Port is to be increased significantly.

(iii) At present 80% of BOBR wagons and 20% of Box Type Wagons (BOXN) wagons are received at Paradip Port. For faster discharge of coal, Bogie Open Rapid Discharge Hopper Wagon (BOBRN) Rakes must be insisted from Indian Railways instead of BoxN wagons to save Handling time at Paradip Port.

(iv) At Paradip the availability of two berths for all 10 utilities including TANGEDCO is insufficient to transport coal. Hence additional two berths namely, Iron ore handling berth and JSW berth are tied up to ease transportation. Further Priority Berthing scheme for Paradip Port is also adopted.

(v) As the IB valley to Mettur, all rail route is stopped and SCCL to Mettur by rail rakes also reduced and the unloading at Kamaraj Port is sufficient for NCTPS, in order to meet the requirement of coal to MTPS I & II, transporting coal to Karaikal Port, and then by rail to MTPS is employed. Now daily 6 rakes are sent to Mettur to cater the plant needs.

At present, TANGEDCO is chartering 10 nos. of vessels directly for coastal movement of domestic coal required for TANGEDCO's Thermal Power Stations.

In order to transport the required quantity from loading ports effectively, TANGEDCO has taken the following steps:

a) Opted for Minimum Guaranteed Tonnage (MGT) at Paradip Port at MCHP berths (Coal berth 1 and 2).

b) Opted for one more berth – JSW (Jindal South West) - Paradip East Quay Coal Terminal Pvt. Ltd. berth at Paradip Port.

c) Opted for one more berth – IOHP (Iron Ore handling Plant) berth at Paradip Port.

In order to discharge the above required quantity effectively, TANGEDCO has taken the following steps:

i. Additional discharge port i.e Karaikal Port is presently operational for movement of coal to MTPS I and II.

ii. Additional berth ECTPL – Ennore Coal Terminal Pvt. Ltd. has been proposed at

Kamarajar Port, Ennore for movement of coal from ECTPL to NCTPS I and to Mettur I & II.

Direct chartering of vessels (ships) by TANGEDCO has resulted in savings in expenditure of about Rs.271 crore.

VIII. Mines

I. Securing of Coal blocks through Auction

To meet the coal requirement of TANGEDCO's upcoming Thermal Power Projects from own source TANGEDCO has been participating in tender for Auction of Coal Mines by MoC.

II. Chandrabila coal block

The Ministry of Coal had allocated Chandrabila coal block in Odisha with reserve capacity of 896 Million Tonnes to Tamil Nadu Generation and Distribution Corporation Ltd on 24.02.2016. TANGEDCO had signed Coal Block

Development and Production Agreement with Ministry of Coal on 30.03.2016.

The two critical issues that are hindering the developmental activities of coal block are lack of area within the coal block for dumping overburden to be removed and the non-issuance of clearance for exploration in the forest area of Chandrabila coal block.

TANGEDCO has requested the Ministry of Coal (MoC) to approve the proposal for mining in the non-forest area and to provide the boundary co-ordinates of non-forest area for demarcation and preparation of Mine Plan etc., for non-forest area.

To expedite the development of Chandrabila coal block, tender to be floated for the selection of Mine Developer and Operator (MDO) with certain modifications to attract more bidders.

III. Arrangement of Domestic Coal Linkages

To meet the commissioning schedule of NCTPS stage III (1 x 800 MW) and Uppur Thermal Power Project (2x800 MW), Fuel Supply Agreement (FSA) with Singareni Collieries Company Ltd (SCCL) for a quantity of 5.913 MTPA (50% of total coal requirement) is to be executed shortly.

The Standing Linkage Committee of Ministry of Coal has recommended for grant of Bridge Linkage (short term coal linkage) for Ennore SEZ TPP (2 x 660 MW), ETPS Expansion TPP (1 x 660 MW) and Udangudi TPP stage-I (2 x 660 MW) from SCCL.

1.2 PROJECTS

The peak Demand at present is 17,196 MW for the year 2021-22 and this is expected to reach around 24,000 MW in next 10 years. In order to cater to this rising demand of Power in the State, as announced on the floor of Assembly all necessary steps have been initiated to speed up the commissioning of all the ongoing projects and also necessary actions have been taken to accelerate the upcoming projects. Apart from this, in order to be self-sufficient, the own generation has to be increased and new projects have been explored.

It is proposed to add a capacity of 6,220 MW to the grid in the next five years as detailed below:

Sl. No	Ongoing Project	DPR Value Rs. in crore	Value of award (in Rs. crore	Expendi-ture so far incurred (Rs. in crore)	Scheduled Date of Comple-tion	Expect-ed Date of Completi on
1	NCTPP Stage III 1x800 MW	8,723	6,317	5,452	July 2019	2022-23
2	Ennore SEZ 2 x 660 MW	9,800	7,814	4,715	May 2019	2023-24
3	Udangudi Stage I 2x660 MW	13,077	9,752	3,868	June 2021	2023-24
4	Uppur Thermal Power Project (2x800 MW)	12,778	10,566	3,133	June 2021	2026-27
5	ETPS Expansion Thermal Power Project (1x660 MW)	6,381	4,443	-	March 2025	2026-27
6	Kundah HEP- (4x125MW)	1,831	2,424	467	March 2024	2023-24
7	Kollimalai HEP (1X20MW)	339	307	151.42	April 2021	2023-24

I. Ongoing Thermal Power Projects

1. North Chennai Thermal Power Projects Stage-III (1 x 800 MW)

The total project cost including Interest During Construction (IDC) is Rs. 8,723 crore. LOA has been issued to M/s. BHEL for Boiler, Turbine and Generator (BTG) package and M/s. BGR Energy Systems Limited (BGRESL) for Balance of Plant (BoP) and related Civil works..

Physical Progress: 89.09%

Financial Progress: 82.9 %.

The following milestone activities (i) Boiler light up (ii) Condenser Hydro Test (iii) Auxiliary Boiler Hydro test and (iv) Auxiliary Boiler light up have been completed.

Critical Works and Schedule of Completion

1	Cooling Water System	:	May 2022
2	Turbine Deck Floating & TG on Barring gear	:	July 2022

3	Coal Handling & Ash Handling	:	August 2022
4	Synchronization	:	September 2022
5	Full load	:	September 2022
6	Performance Guarantee Test	:	December 2022.

The commissioning of the project is delayed due to Cooling water system, Coal handling & Ash handling System and covid-19. All necessary steps are being taken to speed up the project and the project is expected to be commissioned by September 2022.

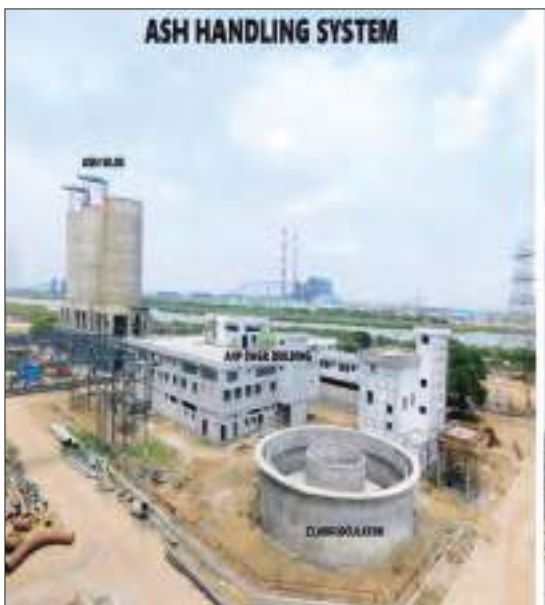
North Chennai Thermal Power Projects Stage-III

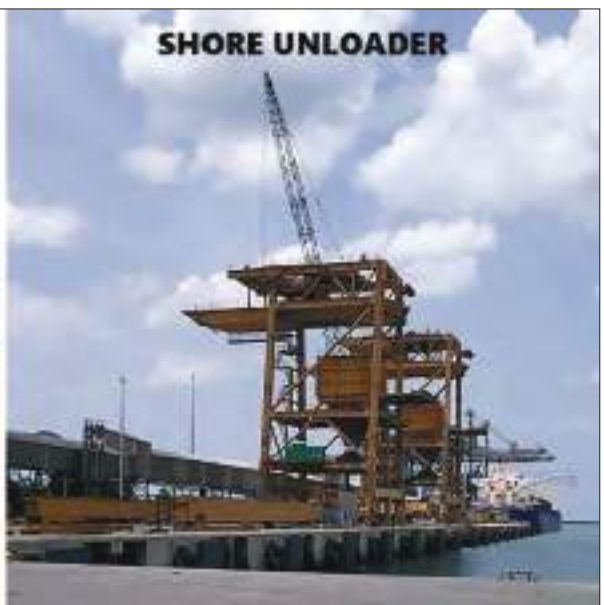
Installation of dust screen system

In order to prevent the air borne coal dust particles from getting accumulated / deposited on the mechanical, electrical equipment and all supersensitive electronic control panels/ instruments installed in the various equipment systems of NCTPP-III, it has been proposed to provide a Dust Screen system.

North Chennai Thermal Power Projects Stage-III

North Chennai Thermal Power Projects Stage-III





2. Ennore SEZ Thermal Power Project (2 x 660 MW)

The total project cost including Interest During Construction (IDC) is Rs. 9,800 crore. EPC cum debt finance contract awarded to M/s. BHEL.

Physical Progress: 51.8 %

Financial Progress: 60.3%.

Critical Works and the schedule of completion

1	Boiler Hydro test (non-drainable)	:	30.08.2022
2	Commencement of Turbine erection	:	15.01.2023
3	Boiler Light Up	:	30.09.2022
4	Cooling Water System	:	08.05.2023
5	Coal Handling System	:	12.05.2023
6	Synchronisation	:	30.05.2023.

The scheduled date of completion was May 2019. The commissioning of the project was delayed due to finalisation of sub-contractors for various project activities and due to inadequate manpower mobilization by the EPC contractor. At Present all necessary speedy actions have been taken and the project is expected to be commissioned during the year 2023-24.

Ennore SEZ Thermal Power Project

3. Udangudi Thermal Power Project – Stage I (2x 660 MW)

The total project cost including Interest During Construction (IDC) is Rs. 13,077 crore. Letter of Intent (LOI) was issued to M/s BHEL for Design, Engineering, Manufacture, Supply, erection, testing and commissioning on single EPC basis. Letter of Intent (LOI) was issued to M/s. ITD Cementation India Ltd. to execute EPC contract for establishment of Captive Coal Jetty and Unloading facilities with Pipe conveyor system.

The Project is under execution stage and the current progress is as below.

- **Main Plant**: Physical Progress : 54.94 %
  Financial Progress : 35.11 %.
- **Coal Jetty**: Physical Progress : 71.08 %
  Financial Progress : 70.91 %.

The scheduled completion of the Project is by June 2021. However, the project is delayed

due to non-finalisation of sub vendors in time and inadequate manpower mobilization by M/s. BHEL to the requirement and covid-19 pandemic. The Project expected to be commissioned by June 2023.

Critical Works and the schedule of completion

Main Plant

1	Boiler Hydro Test	:	May 2022
2	Boiler Light Up	:	December 2022
3	TG on Barring Gear	:	March 2023
4	Synchronization	:	April 2023
5	Performance Guarantee Test	:	June 2023

Coal Jetty

1	Jetty pile	:	September 2022
2	Breakwater	:	October 2022
3	Coal Conveyor System	:	October 2022

Udangudi Thermal Power Project – Stage I

Udangudi Thermal Power Project – Stage I

Udangudi Thermal Power Project – Stage I

4. Uppur Supercritical Thermal Power Project - 2X800 MW

The total project cost including Interest During Construction (IDC) is Rs. 12,778 crore. LOA for supply, erection & commissioning of BTG package along with connected civil works issued to M/s. BHEL. The contract for Sea water intake and outfall system issued to M/s L & T Ltd.

- The National Green Tribunal Southern Zone, Chennai (NGT) in the judgment on public case, directed TANGEDCO to suspend the work for six months period on 17.03.2021. Based on the above, the project works have been suspended from 18.03.2021. TANGEDCO Board in its meeting dated 29.04.2021 directed to shift the Uppur project to Udangudi site.

- In the meantime, the order of the National Green Tribunal has been stayed by the Supreme Court on 01.07.2021.

- GoTN has directed to restudy the Shifting of Uppur Project so as to meet the rising power demand. Based on the above, High level committee has been constituted to restudy the Shifting of Uppur Project and the Committee has recommended that the above Project shall be executed at Uppur itself.

- TANGEDCO has directed to obtain opinion from the Strategic Consultant Consultant regarding the viability and feasibility of Uppur Project. Further, it has been advised to submit the above report in a broader perspective of need for coal based plants.

Uppur Supercritical Thermal Power Project

Uppur Supercritical Thermal Power Project

5. ETPS Expansion Thermal Power Project (1 x 660 MW)

The total revised project cost is Rs. 6,381 crore with Interest During Construction (IDC). Letter of intent (LOI) for EPC contract was issued to M/s. LANCO Infra Tech Ltd (M/s. LITL) for a value of Rs.3,921.55 crore. Later, the contract to M/s. LITL was terminated due to poor performance and Corporate Insolvency Resolution Process initiated on the contractor by IDBI in Honorable National Company Law Tribunal (NCLT), Hyderabad under Insolvency and Bankruptcy Code (IBC) 2016.

Letter of award (LOA) for executing the balance works on 'as is where is basis' condition was issued to M/s. BGRESL, Chennai on 02.03.2019. The projects new Environmental Clearance was received from Ministry of Environment, Forest and Climate Change (MoEF&CC) on 11.12.2019 and the Letter of Intent (LOI) for the new contract was issued to

M/s BGRESL on 12.12.2019 for a value of Rs.4,442.75 crore. A new order was issued on 09.03.2022 for the same value.

6. Mechanization of CJ-I at VOC Port, Tuticorin

Phase-I works are under execution and has achieved a **physical progress of 56.05 % and Financial Progress of 38.09 %.**

Milestone activities such as (i) Piling works (ii) Pre-casting of Pile muffs (iii) Pre-casting of Transverse beams have been completed.

Works under progress and the schedule of completion

1	Design & Engineering	:	15.04.2022
2	Supply	:	31.05.2022
3	Civil Construction	:	15.04.2022
4	Fabrication structure	:	29.05.2022
5	Erection of structures	:	22.10.2022

Mechanization of CJ-I at VOC Port, Tuticorin

Mechanization of CJ-I at VOC Port, Tuticorin

The scheduled completion of the project as per LOI is August 2022 (18 months). Extension of Time has been granted due to COVID-19 and the project is expected to be commissioned by November 2022.

7. Kundah Pumped Storage Hydro Electric Project (4x125 MW)

The Civil works of the project have been awarded to M/s. Patel Engineering Limited, Mumbai under Package-I & Package-II of Phase I. The Electro-Mechanical works have been awarded to M/s. Megha Engineering & Infrastructures Ltd, Hyderabad under Package-III of Phase-I (1 Unit), and Phase-II (2 Units) and Phase-III (1 Unit).

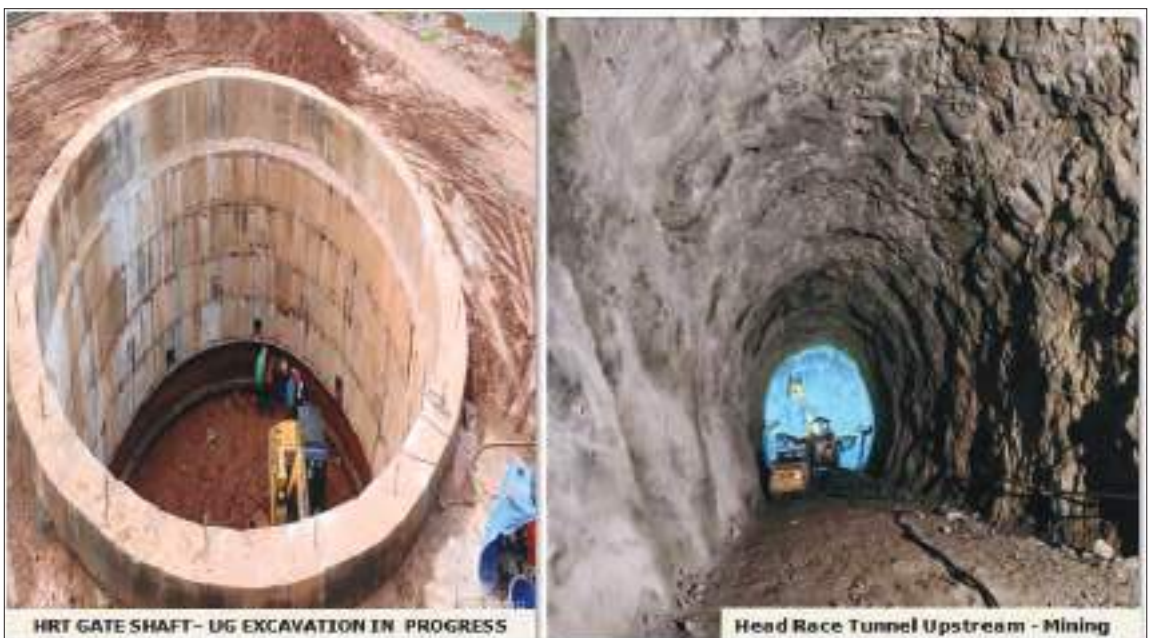
Physical progress: 27%

Financial progress: 19.65%.

The excavation of Power House Cavern is under progress and expected to be completed by May 2022. The site would be ready for erection of Draft Tube Liners in June 2022. M/s. Patel

Engineering Ltd. have been asked to submit the revised schedule covering all the Units of Power House Civil works.

The scheduled date of commissioning is March 2024.



Kundah Pumped Storage Hydro Electric Project

Kundah Pumped Storage Hydro Electric Project

Kundah Pumped Storage Hydro Electric Project

8. Kollimalai Hydro-Electric Project (1x20 MW)

This Project has been awarded to M/s. K.Rajagopalan & Co, (Leader of Consortium)-SSIPL-GMW-HUNAN ALLONWARD Consortium, under EPC Contract basis.

Physical Progress: 44.50%
Financial Progress : 49.29%

WEIR-1

Acquisition of patta lands (Phase I) for an extent of 5.02.50 hectare is in advanced stage. After acquisition of the same, the construction of Weir-1 will be taken up and completed by 31.03.2023.

WEIR-2

A technical expert committee is formed to finalize the design of this Weir, as it is proposed with a rock fill design for the left flank block due to site conditions and it is under progress.

WEIR-4 & FLUME FROM WEIR-3 TO WEIR-4

Phase-II acquisition of patta lands for an extent of 1.87.00 hectare is being closely followed up with the Revenue Department. After acquisition of these lands, construction of Weir-4 and Flume from Wier-3 to 4 will be taken up.

Power Tunnel

Mining work (3,550 m) has been completed on 26.03.2022. Lining will be commenced by May 2022 and completed in 10 months.

Power House

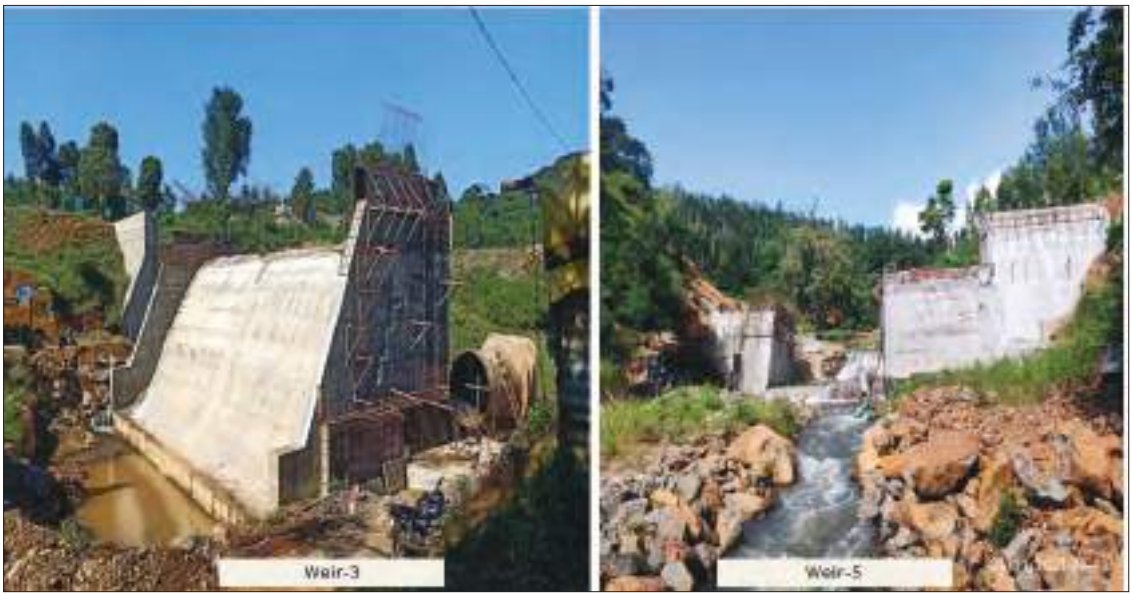
First stage concreting for the sub-structure has been completed. Letter of Credit (LC) has issued on 04.02.2022 to M/s. Hunan Allonword Hydro Generating Equipment, China, the manufacturer and supplier of the Hydro-generating equipments.

Penstock

Fabrication of Penstock is under progress.

The Project is scheduled for commissioning in 2023-24.

Kollimalai Hydro-Electric Project



Kollimalai Hydro-Electric Project

II. Upcoming Projects

1. Udangudi Thermal Power Project Stage–II (2x660 MW) and Udangudi Thermal Power Project Stage–III (2x660 MW).

GoTN has accorded approval for the establishment of Udangudi Thermal Power Project Stage II & III-2x660 MW each. Subsequently, in GO (Ms) 11 dt 23.02.22, GoTN has accorded administrative sanction for acquisition of 1500 acres of land.

The approval process for engaging Revenue unit for the land acquisition is in progress.

The preliminary activities are under process to get Terms of reference from Ministry of Environment, Forest and Climate Change (MoEF&CC).

2. Sillahalla pumped storage Hydro–Electric Project (2000 MW) / Nilgiris District

In-principle approval accorded by GoTN to execute the project in 2 phases due to technical reasons and on advice of CEA.

Stage-I (1000 MW)

In the first instance, Stage-I (1,000 MW) of the project with proposed new Sillahalla reservoir as Upper Reservoir and a new reservoir below the existing Kundah Paalam as lower reservoir is taken up. The estimated project cost is Rs. 4,952.17 crore. Preparation of Detailed Project Report (DPR) is under progress through Consultant M/s. WAPCOS Ltd., Gurgaon and expected to be completed by June 2022.

This project is expected to be commissioned in 2028-29.

Stage-II (1000 MW)

Open tenders were called for, towards fixing the Consultant for the work of Preparation of pre-feasibility Study Report to ascertain the Techno-Commercial viability of the project and Letter of Acceptance has been issued to M/s. NTPC Ltd., Noida on 25.01.2022. Preparation of draft pre-feasibility is under progress and expected to be completed by April 2022.

New Projects

Presently only 1/3rd of the State's power requirement is met by own generation. Further, most of the existing Thermal Stations are nearing retirement. TANGEDCO, therefore has to explore various forms of generation to meet out the rising demand. The world is moving towards clean energy and Tamil Nadu is pioneer in encouraging the clean energy. Hence the government encourages the development of

Renewable energy (RE) to limit the carbon emission.

Huge addition of RE power to grid is a challenge to grid balancing. Presently, battery energy storage technology is very costly. In order to overcome the challenges and to improve the State own Renewable energy generation, the study of feasibility of establishing Pumped Storage projects and Gas Engine power projects was announced by the Government during 2021-22 in the Assembly.

1. Kodayar Pumped Storage Hydro Electric Project (500 MW), Kanyakumari district & Manalar Pumped Storage Hydro Electric Project (500 MW), Theni district

The work of consultancy services towards preparation of feasibility report and obtaining Terms of Reference (ToR) from Ministry of Environment, Forest and Climate Change (MoEF&CC) has been awarded to M/s. TRACTEBEL ENGINEERING Ltd., Gurugram,

Haryana on 21.12.2021 for both Kodayar and Manalar Pumped Storage Hydro Electric Projects.

The feasibility report is to be completed by August 2022.

2. 11 Nos. of Pumped Storage Hydro Electric Projects with total capacity of 7,500 MW in various districts.

11 new locations have been identified in various districts of Tamil Nadu to establish New Pumped Storage Hydro Electric Projects (PSHEP) for a total capacity of 7,500 MW.

The Projects have been grouped as below:

Group-I	Group-II	Group-III
Nilgiris district	**Kanyakumari / Tirunelveli District**	**Coimbatore / Dindigul / Theni / Salem District**
i) Upper Bhavani PSHEP (1,000 MW) ii) Sandy Nalla PSHEP (1,000 MW) iii) Sigur PSHEP (500 MW)	i) Chattar PSHEP (500 MW)/ Kanyakumari ii) Velimalai PSHEP (500 MW)/ Kanyakumari iii) Karayar PSHEP (500 MW)/ Tirunelveli	i) Aliyar PSHEP (1000 MW)/ Coimbatore ii) Palar-Porathalar PSHEP (1000 MW) / Dindigul iii) Athur PSHEP (500 MW) / Dindigul iv) Manjalar PSHEP (500 MW) / Theni v) Mettur PSHEP (500 MW) / Salem

Group I Projects - Letter of Acceptance (LoA) for the consultancy work towards preparation of pre-feasibility report has been awarded to M/s. NTPC Ltd., Noida on 25.01.2022.

Group II and III Projects - Letter of Acceptance (LoA) for the consultancy work towards preparation of pre-feasibility report has been awarded to M/s. TCE Ltd., Bangalore on 25.01.2022.

The prefeasibility report is expected to be completed by April 2022.

3. Installing gas engine power projects in Ennore to a tune of 2,000 MW capacity comprising of smaller capacity gas engine power projects of 18 to 20 MW based on the feasibility.

To meet the rising demand and to manage the renewable energy integration, it is proposed to install gas engine power projects of smaller capacity of 18 to 20 MW totaling to 2,000 MW capacity, based on the feasibility. It is proposed to utilize Regasified-Liquified Natural Gas (R-LNG) available in M/s. Indian Oil Corporation Limited (IOCL) terminal at Ennore.

M/s.Aquatherm Engineering Consultants (India) Ltd., Chennai has been appointed as consultant and work order issued on 16.04.2022 for carrying out the feasibility study and preparation of Detailed Project Report (DPR).

Review conducted by Hon' ble Minister for Electricity, Prohibition and Excise on 03.01.2022 on the implementation of the Announcements made in the floor of Assembly

1.3 TRANSMISSION

TANTRANSCO is consistently commissioning new transmission infrastructure, upgrading and strengthening the existing network to meet the increasing power demand of the State, due to urbanization/ commercial/ Industrial growth. Further, to deliver the Power requirements of Chennai Metro Rail Project Phase-2, Railway Electrification works in the State and Investments proposed in the Electric Vehicle segment to create e-mobility and data centre, development of Transmission Infrastructure across the State is imperative. Therefore, TANTRANSCO is executing various Transmission Schemes at different Voltage Levels.

During the financial Year 2021-22, TANTRANSCO has commissioned 4 nos. of 230 kV Substations namely, TNEB Headquarters (GIS), Tirupattur, Thuvakudi and Mambalam (GIS), in addition to 17 nos. of 110 kV Substations,

742.21 Circuit kms of EHT lines, 110 nos. of additional/ Enhancement of Power Transformers with the capacity of 2,035 MVA, 3 nos. of Reactors with 375 MVAR and 21 nos. of Capacitor Banks with 174 MVAR have been commissioned.

Voltage Level	SS in Nos.	EHT Lines
400 KV	016	4,590.02
230 KV	113 *	11,269.97
110 KV	931 **	20,526.77
66 KV	003	83.00
TOTAL	**1,063**	**36,469.76**

* - 1no.Mambalam 230 KV GIS has been upgraded from 33 KV SS.

** - 2 nos. 110 KV SS Pulianthope and Mettupatty have been upgraded from 33 KV SS.

Inauguration of 20 Nos. of Substation on 24.11.2021

1.3.1 Development of 765 kV Transmission Network

TANTRANSCO is acting swiftly to commission 2 Nos. of 765 kV substations in Tamil Nadu at North Chennai (GIS) and Ariyalur during 2022-23**.** One more 765 kV Substation at Virudhunagar is in progress.

For evacuation of Solar power via Virudhunagar 765 kV SS, erection of 2 nos. of 400 kV DC lines, one from existing Kamuthi 400 kV SS for a Length of 60 kms and another from existing Thappakundu 400 kV SS for a length of 125 kms up to the common point from where Line In Line Out (LILO) will be made to Virudhunagar 765/ 400 kV SS.

North Chennai (GIS) – Thiruvallur District

Ariyalur 765 kV AIS - Kallakurichi District

In order to build up the transmission infrastructure in Coimbatore, Salem and Mettur area and to export the power from North Chennai Pooling Station to Coimbatore region via Ariyalur, one no. of 765 kV substation at Coimbatore has been planned. Additional acquisition of land for the Substation is in process. It is proposed to interconnect the Coimbatore 765 kV substation with Ariyalur 765 kV SS, by erection of 765 kV DC line for a length of 240 kms and with Edayarpalayam 400 kV SS by erection of 400 kV DC line for a length of 47 kms. Also establishing of downstream transmission network connecting Coimbatore 765 kV SS with Rasipalayam and Palavadi 400 kV substations by making LILO of Rasipalayam – Palavadi 400 kV line at Coimbatore SS for a length of 30 kms has been proposed.

This 765 kV system would enhance the reliability and performance of power system in the State.

1.3.2 Development of 400 kV Transmission Network

To make the Chennai City Transmission Infrastructure more robust, reliable and strong, development of Network has been planned with the objective of transferring power to load centers by establishing 6 Nos of 400 kV Substations namely, Thervoikandigai, Pulianthope (GIS), Guindy (GIS), Korattur (GIS), Taramani (GIS) and Koyambedu (GIS).

The works of Pulianthope (GIS) are in advanced stage and expected to be commissioned during 2022-23. The works of Korattur (GIS) and Taramani (GIS) are in progress and expected to be commissioned during 2023-24. Thervoikandigai and Guindy (GIS) will be commissioned at 400 kV Level during 2023-24. Further, 400 kV GIS substation at Koyambedu is at tendering Stage.

Pulianthope 400 kV GIS - Chennai District

Apart from Chennai, to cover various regions of Tamil Nadu, works are in progress for 4 Nos. of 400 kV substations namely, Vellalaviduthi, Edayarpalayam, Ottapidaram and Parali. Notably, one substation at Samugarengapuram proposed under Green Energy Corridor, will be taken up on approval from Department of Economic Affairs (DEA). The aforesaid schemes have been planned for System Strengthening and for Green Energy Evacuation.

1.3.3 Development of 230 kV Transmission Network

To strengthen the Chennai Transmission Network at 230 kV level, works are in Progress for 3 nos. of substations namely, Thiruvanmiyur (GIS), Maraimalainagar and Mambakkam. Further, 6 nos. of substations namely, Ennore (GIS), Ganesh Nagar (GIS), Panjetty, Avadi, K.K. Nagar (GIS) and Pallavaram (GIS) are at tendering Stage.

To cover various Regions of the State, 16 Nos. of 230 kV substations have been planned across the State except Greater Chennai for system strengthening and flexibility of operation. Works are in progress for 8 nos. of substations namely Selvapuram, Erode, Nanguneri, Nallur, Sathumadurai, Kalivelampatty, Karuppur and Vembakkam in various Districts of Tamil Nadu.

Action is being taken up, to commission all the substations.

Erode 230 KV GIS – Erode District

1.3.4 Projects funded with External Assistance

A. Japan International Cooperation Agency (JICA)

Funding assistance of Rs. 3,572.93 crore has been sanctioned under the Official Development Assistance (ODA) Loan of JICA for creation of Transmission Network. Initially, 5 Nos of 400 kV substations and 12 Nos of 230 kV substations along with associated transmission lines have been approved at a cost of Rs. 2,494.67 crore. Out of 17 schemes, all schemes have been completed except 2 nos. namely 400 kV GIS substations at Guindy and Korattur where works are in progress. Subsequently, additional schemes at an estimated cost of Rs.1,168.30 crore have been approved by JICA for establishing additional transmission network which are at tendering Stage.

Guindy 400 kV GIS - JICA Chennai District

TNEB Headquarters GIS - Chennai District

B. Schemes under Green Energy Corridor – Phase –I (GEC-I)- Funded by KfW (German Development Bank), Germany.

The transmission network is being implemented under Green Energy Corridor with the financial assistance of Rs.538.91 crore as Grant under National Clean Energy Fund (NCEF), a soft loan of 76 million Euros from KfW German funding and the balance as equity by TANTRANSCO at a Project cost of Rs. 2,049.39 crore including GST. All schemes under GEC-I have been completed, except 230 kV line from Arasur 230 kV SS to Ingur 230 kV SS.

C. Schemes Proposed for Green Energy Corridor – Phase –II

Establishment of 400 kV Substation at Samugarengapuram in Tirunelveli district, 3 nos. of 230 kV substations at Poolavady and Kongalnagaram in Tiruppur district and

Muppandal in Kanyakumari district have been approved under Green Energy Corridor Phase –II by availing MNRE Grant. MNRE has approved Rs.719.79 crore towards the above schemes with MNRE Grant of 33%. Balance 47% to be funded as Loan from KfW and 20% as equity from TANTRANSCO. On getting further concurrence from DEA for loan tie-up, tenders will be called for.

D. Schemes under Chennai – Kanyakumari Industrial Corridor (CKIC) Funded by ADB

Establishment of Virudhunagar 765 kV SS and Ottapidaram 400 kV SS along with the associated lines, at a total cost of Rs. 4,332.57 crore for evacuation of electricity from new generation capacity additions including renewable energy in southern districts and to strengthen the transmission connectivity between southern and northern ends of the proposed Chennai Kanyakumari Industrial

Corridor (CKIC) is under progress. Asian Development Bank (ADB) is funding for an amount of 451 Million USD for the project. This project is being supported by GoTN with a funding of Rs. 1,000 crore.

Virudhunagar 765 KV SS in Virudhunagar District

Organizational Transformation Study funded by ADB

In order to improve the overall performance of TANGEDCO and TANTRANSCO, a detailed strategic study of the finances and governance structure of TANGEDCO & TANTRANSCO has been undertaken with ADB funding under Chennai – Kanyakumari Industrial Corridor (CKIC). Consultant was appointed as the consultant on 25.10.2021. The study is under progress.

1.3.5 Projects under Tamil Nadu Investment Promotion Programme (TNIPP)

Phase – I

6 Nos. of transmission schemes have been planned for execution under TNIPP Phase –I. An amount of Rs. 195.23 crore has been funded by GoTN for the schemes against the project cost of Rs. 216.39 crore and balance amount of Rs.21.26 crore as equity from TANTRANSCO.

Out of 6 nos. schemes, 5 nos. have been completed and 110 kV GIS substation at Munusamy Salai is under progress.

Phase – II

15 Nos. of transmission schemes have been planned for execution under TNIPP Phase – II. The project cost of Rs.481.65 crore has been funded by GoTN for the schemes. Out of the 12 nos. of awarded schemes, 8 nos. have been completed. Balance 4 nos. viz., Papparambakkam 110 kV SS, Kunjalam 110 kV SS, Thiruvanmiyur 230 kV GIS and associated Lines of Thuvakudy 230 kV SS are in progress. 3 nos. of schemes viz., Avadi 230 kV SS, Panjetty 230 kV SS and Maduravoyal 110 kV GIS are at tendering stage.

Thuvakudy 230 kV SS - Trichy District

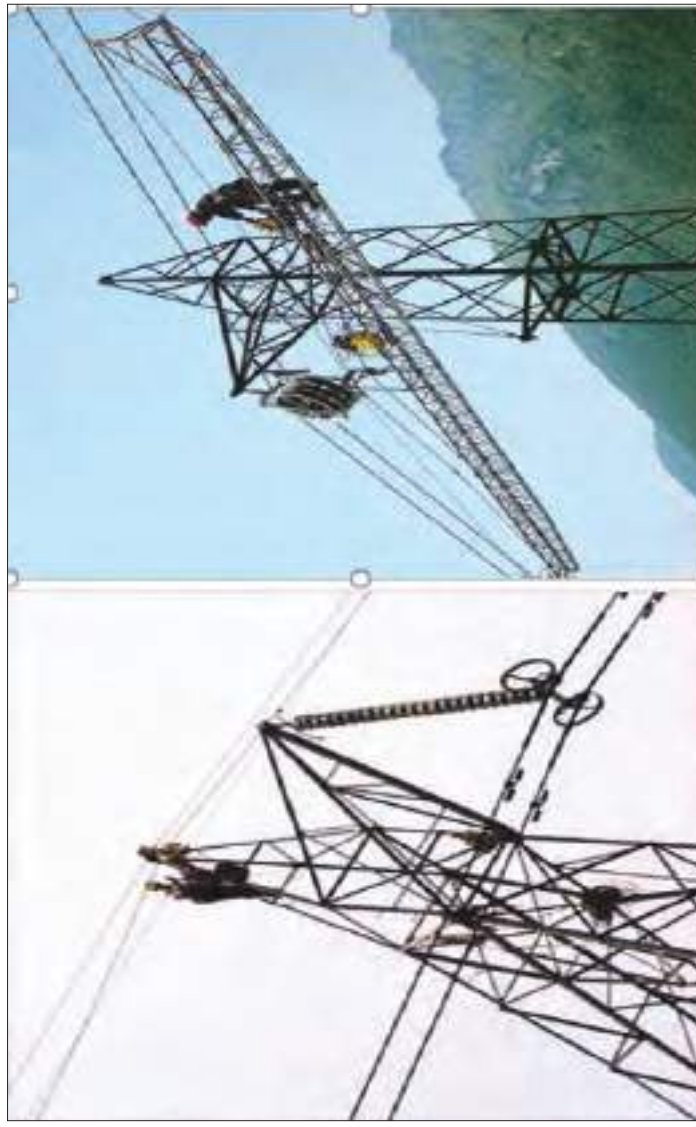
1.3.6 Reliable communication Project

The scope of this project is to provide reliable Optical Ground Wire (OPGW) based Fibre Optic Communication with Data Acquisition system to all 110 kV & above level substations in Tamil Nadu at a total estimated project cost of Rs. 479.84 crore.

Ministry of Power have sanctioned grant of Rs. 155.48 crore from Power System Development Fund (PSDF) for implementation of the above scheme in Tamil Nadu. This scheme envisages laying of 10,770 km 48 fibre OPGW in EHT towers for connecting 110 kV and above level substations in Tamil Nadu.

In this scheme, supply of 7,296 km OPGW and erection of 5,179 km have been completed, out of the total 10,770 km as per contract. So far, Rs. 67.53 crore has been spent for this project.

The works are expected to be completed by December 2022.



1.3.7 Strengthening of Transmission Network

In order to develop the Transmission Network further and to fulfill the larger public interest, the Government during 2021-22 have announced 171 schemes for establishing new substations and upgrading of existing SS at a total estimated cost of Rs. 2,104 crore and also 289 schemes for erection of additional & enhancement of power transformers in the existing substations in various districts of Tamil Nadu for an estimated cost of Rs. 679 crore.

Out of 159 numbers of 230 kV, 110 kV & 33 kV level new substations, within a short span of 6 months, land has been identified for 140 nos. of substations and sanction has been accorded for 89 Nos. and out of 12 nos of Upgradation of 33 kV Substations into 110 kV Substations, 4 Nos. have been sanctioned and are at tendering stage.

Moreover, out of 289 schemes of erection of additional & enhancement of power transformers in the existing substations, sanction has been accorded for 260 nos. of schemes and 53 Nos. have been energized. Balance works are under progress and necessary efforts are being taken to complete all the projects at the earliest thereby improving the voltage profile in these areas. This scheme is expected to be completed within two years.

The Government has also taken necessary action in speeding up the process of establishing 45 numbers of new substations of various voltage levels in order to strengthen the Transmission network.

Out of the total 216 nos. of SS schemes, land is yet to be identified for 23 nos. of SS schemes.

1.3.8 EHT Maintenance Works without interruption

In the year 1957, Hot lines wing was established in the erstwhile TNEB with the objective of attending EHT line maintenance works by the workmen without interrupting the EHT supply. One number Hot line subdivision was formed with headquarters at Chennai.

Considering the importance of the Hot line works, Hot line subdivisions were formed in Coimbatore, Thiruvalam, Madurai and Trichy in a phased manner and they are functioning in an effective manner.

As a unique and noteworthy feature in the last financial year, by carrying out Hot line works utilizing the specially trained hot line workmen, a loss of 151.02 million units has been avoided.

HOSUR LINE AREA

THIRUVALAM LINES

SINGARAPET

HOSUR

THIRUVALAM

1.3.9 Major Issues involved in establishment of Transmission Schemes

Due to delay in acquisition of Land, commissioning of EHT substations are getting delayed. In respect of EHT lines, the delay is mainly due to RoW issues, objection by land owners, stay orders by courts, delay in obtaining statutory clearances from Railways, NHAI, Forest department, etc.

1.3.10 Reduction of huge capital investment on Central transmission schemes by the efforts of TANGEDCO thereby avoiding huge Commitment on Transmission charges.

- Central Transmission Utility (CTU) proposed a new transmission scheme at a capital investment of Rs.9485 crore for evacuation of power from the anticipated Renewable Energy generation capacity addition of 18.5 GW in Southern Region.

TANGEDCO strongly protested against the proposal since there were neither identified generators nor beneficiaries.

- Based on the consistent efforts of TANGEDCO before SRPC, Standing committee and Central Electricity Regulatory Commission (CERC), the proposal was revised by CTU for a capacity addition of 8 GW, thereby **reducing the Capital investment to Rs. 1,628 crore**. Hence huge redundant investment and unnecessary financial burden in the future transmission charges of TANGEDCO was avoided.

1.4 DISTRIBUTION

Distribution networks are distinguished from transmission networks by their voltage level and topology. Power is despatched in distribution through High Tension and Low Tension networks either through lines on poles or through underground cables in many urban and coastal area. The main objective is distribution of uniform supply till it reaches the end consumers.

The Distribution wing strives to provide 24x7 reliable and un-interrupted power supply to its 3.25 crore consumers. Power is distributed through High Tension and Low Tension networks through 33/11 kV Substations, 11/22 kV Distribution Transformers, low voltage lines and underground cables.

In order to provide uninterrupted power supply taking into account the growth in consumption, works are undertaken for revamping the existing system by adoption of new

technology, for reducing losses, developing a cyclone resilient network, providing new Distribution transformers to reduce Low Voltage and providing of RMUs to eliminate outdoor faults, providing a secured network to prevent accidents and ensuring public safety, etc to ensure consumer satisfaction. Various IT initiatives have also been undertaken to facilitate the easy interaction with the utility by the consumers. Energy conservation measures are also being implemented for energy efficiency and savings.

1.4.1 Salient Features

During the year 2021-22, **26 nos. 33 kV substations, 10 nos. augmentation in existing substations, 10,258.75 kms of LT lines, 6,429.83 kms of HT lines and 24,036 distribution transformers** have been energized. Further, new service connections have been effected to 9.91 lakhs consumers. There are 1.75 lakhs dismantled and disconnected

temporary services etc.,. Hence, the net rise in the consumers during 2021-22 is **8.16 lakhs.**

DISTRIBUTION NETWORK	
33kV Substations	773 Nos.
High Tension Lines (HT)	1.88 lakh kms
Low Tension Lines (LT)	6.17 lakh kms
Distribution Transformers	3.73 lakhs
Consumers	324.54 lakhs

Category wise total number of consumers being served in the State by TANGEDCO as on **31.03.2022** is as follows:

Sl. No.	Category	2020-21 Numbers in Lakhs	2021-22 Numbers in Lakhs
A	**HT Services**	0.1 (10,003 nos)	0.1 (10,417 nos)
B	**LT Services**		
1	Domestic	227.53	233.51
2	Commercial	35.37	36.27
3	Industries	7.38	7.55
4	Agriculture	21.81	22.87
5	Huts	9.89	9.75
6	Others	14.30	14.49
	Total	**316.38**	**324.54**

1.4.2 Effecting of one lakh agriculture service connections in Tamil Nadu during the year 2021-2022 - A historical achievement

Agriculture is the prominent and the best profession in the world. Only if the farmer puts his foot in the mud we can put our hand in the plate.

A famous quote by Thiruvalluvar says:

“உழுதுண்டு வாழ்வாரே வாழ்வார் மற்றெல்லாம்
தொழுதுண்டு பின் செல்பவர்”

Based on the guidance of the Hon’ble Chief Minister, announcement was made on the floor of Assembly, to provide one lakh agriculture service connections, with a view to improve the welfare of farmers and also to increase the agricultural production of the State and to increase the cultivable lands.

Inauguration of 1,00,000 Agriculture Service Connection and issue of sanction order

Based on the Budget announcement, the Hon'ble Chief Minister of Tamil Nadu has inaugurated the visionary scheme of one lakh agriculture service connections on 23.09.2021 at Chennai and issued sanction orders to 10 beneficiaries of new agricultural service connection in person.

Based on the suggestions and guidance given by Hon'ble Minister for Electricity, Prohibition & Excise, work has been taken up on war footing basis. In spite of constraints faced due to COVID pandemic and North East Monsoon rains, meticulous planning was done at various stages to complete the policy decision of the Government in time.

Review meeting held on 14.09.2021 regarding effecting of 1.00.000 agriculture service connections

During the five years period from 2006 to 2011, a maximum number of 2,09,910 Nos. of agriculture service connections were given in the State of Tamil Nadu. Also, during the year 2010-11, a record number of 77,158 agriculture service connections were given.

During 2011 to 2021, 10,000 to a maximum of 47,671 agriculture service connections only were effected in a year. That is an average of 22,100 agriculture service connections were provided in a year.

As on 31.03.2021, a total number of 4,52,777 agriculture applications under various categories were pending.

In order to provide more than what has been achieved previously, the Hon'ble Chief Minister of Tamil Nadu decided to provide 1,00,000 lakh agriculture service connections in 2021-22 and the same was announced in the floor of Assembly. The works were taken up under fast track.

The details of released eligible agricultural applications

S.No.	Category	Description	No of application Released
1	Normal category	Pending registered applications up to the year 31.3.2013	1,18,426
2	RSFS Rs. 10,000 scheme	Pending registered applications during the year 2013-14	11,642
3	RSFS Rs. 25,000 scheme	Pending registered applications up to the year 31.3.2018	68,814
4	RSFS Rs. 50,000 scheme	Pending registered applications up to the year 31.3.2018	1,09,767
5	TATKAL Self Financing Scheme	Already pending applications. *Further, the willing registered applicants who are ready to pay the amount as per the load applied will be given agriculture service connection. Accordingly, 18,320 Nos. applications have been released so far during the year 2021-22.*	12,742

6	Government schemes	All pending registered applications up to date without any target	1,075
		TOTAL	**3,22,466**

Due to the tireless efforts day and night by the Field Engineers & Staff and based on the instructions and close follow-up by the Hon'ble Minister of Electricity, Prohibition and Excise and from Headquarters, the target of one lakh agriculture service connections was achieved in time.

2.13 lakh acres of agricultural lands have been additionally irrigated through this newly provided 1 lakh agriculture service connections during this year 2021-22.

Review conducted by the Hon' ble Minister for Electricity, Prohibition and Excise on 25.01.2022 at TANGEDCO Headquarters, AnnaSalai, Chennai

DISTRICT WISE AGRICULTURAL SERVICES EFFECTED DURING
01.04.2021 to 31.03.2022

Sl. No.	District Name	Normal	RSFS Rs. 10000	RSFS Rs. 25000	RSFS Rs. 50000	TSFS OLD	TSFS 21-22	Govt Schemes	Total
1	Ariyalur	1,217	8	12	10	554	82	11	1,894
2	Chengalpet	536	27	0	27	22	55	0	667
3	Chennai Corporation	0	0	0	0	0	0	0	0
4	Coimbatore	2,988	19	263	270	989	1,098	0	5,627
5	Cuddalore	1,074	0	59	153	47	204	16	1,553
6	Dharmapuri	5,056	321	186	335	438	413	36	6,785
7	Dindigul	4,549	90	8	61	627	545	36	5,916
8	Erode	1,297	40	67	581	733	947	4	3,669
9	Kallakurichi	4,828	23	1	11	79	292	146	5,380
10	Kanchipuram	515	43	1	26	24	46	7	662
11	Kanniyakumari	223	8	0	47	0	23	0	301
12	Karur	2,139	8	16	30	220	391	3	2,807
13	Krishnagiri	4,697	169	407	182	993	448	10	6,906
14	Madurai	1,857	14	40	152	173	244	4	2,484
15	Mayiladuthurai	610	8	0	0	102	10	23	753
16	Nagapattinam	117	1	0	0	3	0	0	121
17	Namakkal	1,730	18	82	140	487	371	1	2,829
18	Perambalur	1,497	0	0	0	79	107	2	1,685
19	Pudukkottai	1,851	41	0	12	467	194	10	2,575
20	Ramanadhapuram	246	23	5	5	49	30	8	366
21	Ranipet	1,571	94	78	274	16	89	25	2,147
22	Salem	2,777	37	64	157	110	466	2	3,613
23	Sivagangai	1,682	5	1	37	449	174	15	2,363
24	Tenkasi	1,262	150	155	252	10	334	9	2,172
Sl. No.	District Name	Normal	RSFS Rs. 10000	RSFS Rs. 25000	RSFS Rs. 50000	TSFS OLD	TSFS 21-22	Govt Schemes	Total

25	Thanjavur	2,219	60	28	22	791	273	5	3,398
26	Nilgiris	84	2	0	11	43	119	0	259
27	Theni	967	9	4	8	533	200	7	1,728
28	Thirupathur	580	22	278	168	48	88	1	1,185
29	Tiruchirappalli	2,455	0	0	1	414	211	34	3,115
30	Tirunelveli	493	59	11	89	64	531	2	1,249
31	Tirupur	4,968	13	113	208	1214	1,054	2	7,572
32	Tiruvallur	2,444	6	36	167	45	110	3	2,811
33	Tiruvannamalai	5,751	14	129	231	93	285	24	6,527
34	Tiruvarur	1,044	41	0	0	196	43	0	1,324
35	Tuticorin	277	4	0	12	136	321	0	750
36	Vellore	915	86	147	300	30	85	4	1,567
37	Villupuram	3,779	10	59	142	121	231	24	4,366
38	Virudunagar	516	7	1	10	180	151	9	874
	Grand Total	70,811	1,480	2,251	4131	10,579	10,265	483	1,00,000

A sum of Rs. 803.19 crore has been incurred for TANGEDCO towards infrastructure development works, to give connections to 1,00,000 Nos.

The Hon' ble Chief Minister of Tamil Nadu in the function " 1 lakh agriculture service i 1 year" held at TANGEDCO Headquarters, Anna Salai issued the service connection order to the final agriculturalist of the one lakh list on 16.04.2022.

The Hon' ble Chief Minister of Tamil Nadu interacted with the one lakh agriculture beneficiaries through Video conference in the function held at TANGEDCO Headquarters, Anna Salai on 16.04.2022.

The Government of Tamil Nadu is providing a subsidy for all agricultural electricity connections at the rate of Rs. 2,875 per horsepower per annum as fixed by the Hon'ble Tamil Nadu Electricity and Regulatory Commission.

The amount of subsidy provided by the Government of Tamil Nadu for agricultural electricity connections for the year 2021-22 is Rs. 4,875 crore.

The Government of Tamil Nadu will provide an additional subsidy of Rs. 181.13 crore every year for these additional 1,00,000 agriculture service connections effected.

The decision of Government of Tamil Nadu to provide one lakh agriculture service connections is a historic and unprecedented.

1.4.3 North East Monsoon rain 2021

Tamil Nadu received torrential rainfall due to North East Monsoon 2021 during the months of November and December 2021. Chennai, Chengalpattu, Kanchipuram, Tiruvallur, Vellore, Ranipet, Tirunelveli and Kanyakumari Districts were severely affected due to this unprecedented rain fall.

Electrical infrastructure like Transmission and Distribution network were damaged due to this rain fall. The damaged Distribution network were as follows

S.No	Description	Quantity
1	Total Poles damaged	5,285 Nos.
2	Total conductor damaged	163 kms.
3	Total distribution transformers damaged	583 Nos.
4	Total substations damaged	14 Nos.

Strenuous efforts were made and supply was restored to the affected consumers immediately by pooling the available man power and materials in TANGEDCO in spite of difficult working conditions like 3 feet water, mud, incessant rain and inaccessible areas.

GoTN has sanctioned a sum of Rs. 15 crore for temporary restoration.

Distribution Transformer charging at Madhavaram II section / Chennai North EDC

Replacement of Damaged Poles- Pandalam, Tiruvannamalai

1.4.4 Pillar box and Power Transformer plinth level heightening works

In the water logging areas, it is proposed to heighten the power transformer plinth level and pillar heights by one meter from ground to prevent forced supply interruption and about 75% of works have been completed.

Progress of Pillar heightening works :

In water logging areas, out of identified 1,420 Nos. pillar box heightening to be done, so far 1,339 Nos. (94.30%) pillar boxes have been heightened in Chennai/Central, North, West, South I and II EDCs. Balance 81 Nos., pillar heightening works are under progress and will be completed shortly.

Sastri Nagar / Adyar Sub Division, Adyar

Progress of Power Transformer plinth heightening works:

After the North East Monsoon, 115 locations have been identified for carrying out the transformer plinth heightening works. Out of which, 12 nos. of Power Transformer plinth heightening works in the following substations have been completed :

i) Egmore 33/11 kV SS- 2 Nos.,
ii) B&C Mill 33/11 kV SS-2 Nos.;
iii) Periyar Nagar 33/11 kV SS- 1No;
iv) Koyambedu Market33/11 kV SS -1 No;
v) Shanthi Colony 33/11 kV SS-1 No.;
vi) Perungudi 110/33-11 kV SS – 1No.;
vii) Mudichur 33/11 kV SS-1 No.;
viii) KK.Nagar 110/33-11 kV SS-2 Nos.
ix) Kodambakkam 110/ 33-11 kV SS- 1 No.

Further, Plinth heightening works are under progress for 5 Nos Power Transformers and will be completed shorthly. Balance works are under various stages of progress.

Mudichur SS-16 MVA Power Transformer Plinth Heightening

Periyar Nagar 33/11kV SS-, Perambur Plinth Heightening

1.4.5 Mass Improvement Program to resolve low voltage by erecting new Distribution transformers

The domestic and commercial consumers are connecting additional electrical equipment in their premises on their own and hence connected load on the Distribution Transformer increases. Hence during morning and evening peak hours, as the consumers use more electric equipment, the Distribution Transformer gets overloaded leading to the failure of Transformer. During such unavoidable situations, supply is interrupted for longer duration resulting in consumer distress.

Similarly, in lengthy low tension lines, tail end consumers face low voltage problems in certain places.

In order to eradicate the above inconvenience to the consumers, Mass Improvement Program was evolved during July 2021, and field inspections were carried out in all the areas of Tamil Nadu. 5,705 Nos. of Distribution Transformers have been identified as

overloaded and 3,200 Nos. of Distribution Transformers with low voltage problem.

Out of total 8,905 DTs identified, it was noticed that in Trichy, Vellore and Villupuram Regions more number of DTs were overloaded and were having low voltage problem.

The erection of 8,905 Nos. of additional new Transformers under Mass Maintenance programme has been inaugurated by the Hon'ble Chief Minister of Tamil Nadu during the month of August 2021.

Inauguration of Scheme by Hon' ble Chief Minister of Tamil Nadu on 29.08.2021

The works were undertaken in all the 234 legislative assembly constituencies by erecting necessary high tension and low tension lines in addition to identified Distribution Transformers (DTs) based on the field condition. DTs of various capacities have been erected, loads have been bifurcated and network has been brought into operation at a total cost of Rs.743.86 crore. Additional capacity of 652 MVA have been created.

Distribution Transformers for reduce the Overload and to rectify the Low Voltage - (District Wise)

Sl. No	Name of the District	Installed Distribution Transformers			Beneficaries
		Over load	Low Voltage	Total	
1	Chennai	227	14	241	9,446
2	Tiruvallur	180	127	307	4,622
3	Kanchipuram	90	47	137	2,078
4	Chengalpattu	121	51	172	2,472
5	Coimbatore	113	41	154	4,524
6	Tirupur	43	16	59	1,666
7	Nilgiris	29	20	49	1,444
8	Erode	54	51	105	3,015
9	Namakkal	43	19	62	2,339
10	Salem	244	71	315	10,312
11	Dindugul	144	99	243	6,908
12	Madurai	35	119	154	5,814
13	Ramnad	74	95	169	6,687
14	Sivaganga	69	35	104	4,008
15	Theni	141	43	184	6,751
16	Tirunelveli	31	33	64	1,354
17	Tenkasi	44	4	48	679
18	Tuticorin	92	104	196	2,977
19	Virudhunagar	19	26	45	696
20	Kanyakumari	98	102	200	2,312
21	Thiruchirapalli	267	83	350	8,063

Sl. No	Name of the District	Installed Distribution Transformers			Beneficaries
		Over load	Low Voltage	Total	
22	Thanjavur	427	247	674	18,835
23	Pudukkottai	335	132	467	10,655
24	Perambalur	118	128	246	6,108
25	Ariyalur	95	102	197	4,249
26	Karur	102	122	224	3,968
27	Tiruvarur	92	68	160	3,810
28	Nagapattinam	67	94	161	3,750
29	Myladuthurai	141	64	205	4,133
30	Dharmapuri	271	105	376	10,913
31	Krishnagiri	245	169	414	13,752
32	Tirupattur	198	163	361	7,305
33	Vellore	376	256	632	17,008
34	Ranipet	186	116	302	9,655
35	Cuddalore	201	60	261	8,274
36	Tiruvannamalai	234	0	234	6,564
37	Villupuram	262	95	357	12,820
38	Kallakuruchi	197	79	276	8,822
	Grand Total	**5,705**	**3,200**	**8,905**	**2,38,788**

Due to bifurcation of loads by erecting new 5,705 Nos. of DTs, the connected loads of transformers in the above areas has been brought

within the permissible limits and uninterrupted supply is being provided.

Due to erection of additional 3,200 Nos. of new DTs to improve low voltage problem, the low tension line lengths have decreased and **line losses have reduced considerably.** Now supply is extended at prescribed voltage to all the consumers, including the tail end consumers even in rural areas.

Details of capacity wise erected DTs

S.No.	Rating in KVA	Numbers
1	500	43
2	250	176
3	200	32
4	100	2,529
5	63	4,568
6	50	1
7	40	43
8	25	1,446
9	16	66
10	10	1
	Total	**8,905**

With this Mass erection of additional 8,905 new DTs, regulated and uninterrupted supply is distributed to the consumers in the above areas covering all the 234 constituencies of the State. Field inspections are continuously being carried out and action is being taken to erect new additional DTs wherever necessary.

KARUR DISTRICT

ARIYALUR CONSTITUENCY

1.4.6 Minnagam

In view of the increasing demand for electricity in Tamil Nadu and for immediate redressal of complaints related to Power supply received from consumers, the Hon'ble Chief Minister of Tamil Nadu has inaugurated Centralised Customer Care Centre “Minnagam” at TANTRANSCO building, Chennai on 20.06.2021.

The consumer can register all complaints related to Power supply in the Mobile number 94987 94987. In Minnagam 37 types of complaints can be registered.

"Minnagam” at headquarters Chennai, is operating with 69 persons per shift, in three shifts per day. Apart from this, complaints are also being received from the consumers in all the Central offices of 44 Electricity Distribution Circles (EDCs) except Chennai Regions all over Tamil Nadu on a shift basis. Three person per day are on shift duties with one additional one person

in day shift on daily basis. The complaints are being received 24x7 and resolved immediately.

All the Complaints received are being closed only after getting confirmation from the complainant that the complaint have been rectified.

The Customer Care Centre “Minnagam” inaugurated by the Hon'ble Chief Minister, has been providing a tremendous service to the people of Tamil Nadu, since its inception. From the date of commencement, 20.06.2021, the total number of complaints received up to 31.03.2022 at the Customer Care Centre “Minnagam” was 7,21,274. Out of which 7,19,420 complaints have been resolved, which is 99.74% of the total.

“Minnagam” has been very popular among the public since its inception, as “Minnagam” provides immediate solutions to all complaints from the public.

The Hon' ble Chief Minister of Tamil Nadu inaugurating Minnagam on 20.06.2021

Functioning of 24X7 Minnagam, Consumer grievances portal inspected by Hon'ble Minister on 07.03.2022

1.4.7 Mass Maintenance Program

In continuation to the Mass Maintenance Program carried out throughout the State for 10 days from 19.06.2021 to 28.06.2021 based on the guidance of Hon'ble Chief Minister of Tamil Nadu, regular maintenance works are being carried out in network and lines, after giving wide publicity to the public through media, and supply is restored immediately after completion of the maintenance works.

The following maintenance works have been carried out **from 1.07.2021 to 31.03.2022**:

S. No	Description	Unit	Quantity
1	Tree branch clearance	Location	7,07,563
2	Damaged poles replaced	Nos.	21,129
3	Low sag rectification carried out	Location	64,562
4	Pillar box maintenance	Nos.	22,645
5	Distribution Transformer (DT) maintenance	Nos.	94,847
6	DT Structure and RMU maintenance	Nos.	17,291

7	HT cable fault rectified	Location	3,414
8	LT cable fault rectified	Location	29,745
	Total		**9,61,196**

1.4.8 Integrated Power Development Scheme (IPDS)

The Ministry of Power/Govt. of India launched Integrated Power Development Scheme (IPDS) for urban area with a population above 5,000 with the objective of providing 24x7 power supply to all, reducing AT & C losses and Electrifying all urban households.

- The scheme works were sanctioned in 521 Towns in 37 circles for executing New/ Augmentation of 33/11 kV Substations, erection of distribution transformers and high tension/ low tension lines, laying of underground cables and installation of capacitor banks at a total project cost of Rs.1,704.34 crore for TANGEDCO.

- ❖ The scheme works in all 37 circles have been completed.
- ❖ The financial closure for all 37 circles for an amount of Rs.1,586.74 crore was submitted to M/s. PFC on 23.03.22 and the same has been approved by MoP/GoI. The total eligible grant of Rs. 959.95 crore has been received, including the grant for PMA.

1.4.9 Fully automated 33/11 kV Gas Insulated Substations (GIS)

With the view to adopt new technology as well as to establish SS in lesser extent of land and to reduce manual operation, 7 numbers of fully automated 33/11 kV Gas Insulated Substations are being established in Chennai at Kannammapet, Damodharan Street, Millers Road, Corporation Colony at West Mambalam, Kodambakkam, Vadapalani & Anakaputhur at a total estimated project completion cost of Rs.147.18 crore.

Millers Road SS with Two Power Transformers and all the other 6 substations with one Power Transformer are commissioned and the balance works are expected to be completed shortly.

1.4.10 Conversion of existing Overhead (OH) lines into Underground (UG) Cables

During natural calamities viz., cyclone/ storm/heavy rains, all infrastructure face devastating damages in areas nearer to coastal region and TANGEDCO networks also get completely damaged due to uprooting of poles, towers and snapping of conductors collapsing the complete network leading to total black out.

Restoration of overhead feeders lines will be a hectic and time-consuming job which require many man days and new materials. Till such time, managing the affected area without power supply is very difficult.

In order to overcome the above difficulties, it is proposed to convert the existing over head lines to under ground cables in Coastal and Delta areas. Apart from this for trouble free operation, less downtime and aesthetic looks implementation of conversion of existing Overhead (OH) lines into Underground (UG) Cables in 5 divisions of Chennai is being implemented.

1.4.11 Coastal Disaster Risk Reduction Project (CDRRP)

TANGEDCO proposed to convert HT and LT overhead lines into HT and LT underground cables in cyclone prone coastal towns of Cuddalore and Nagapattinam with administrative sanction of Rs. 406.83 crore under Coastal Disaster Risk Reduction project with the funding assistance from World Bank.

Works have been awarded in three packages on priority for conversion of overhead lines to underground cables in coastal areas of

Cuddalore district and Velankanni in Nagapattinam district.

Cuddalore package 1 – Conversion of OH to UG cabling system for 22 kV Alpettai, Suthukulam and Pentesia feeders in Cuddalore Town for a value of Rs.158.07 crore. Supply, erection, Commissioning and HT dismantling works in all the six feeders (22KV Alpettai-1&4, Suthukulam-6&7 and Pentesia-1 & 2 feeders) are completed. LT dismantling works are under progress.

Nagapattinam package – Conversion of OH to UG cabling system for 11 kV Velankanni Town feeders in Nagapattinam District for a value of Rs.62.12 crore. Supply, erection, commissioning and HT dismantling works at possible locations in all the six feeders (11KV ECR, Serudur, Velankanni Town-1 &2, Express and Akkarapettai feeders) completed. LT dismantling works are under progress.

Cuddalore Package 2 –Conversion of OH to UG cabling system for 22 kV Sellankuppam-

5&9, New Town(2,6 & 8) and Manjakuppam -7 (part) feeders in Cuddalore Town (22 kV Sellankuppam-5&9, NewTown-2,6&8 and Manjakuppam -7 feeders) for a value of Rs.190.86 crore.

All 6 nos. of bay extension works are commissioned at 110/22 kV Semmankuppam and Semmandalam Substations. 22 kV Custom Switching station & 22 kV Anna Stadium switching stations commissioned on 19.04.2021 and 13.05.2021 respectively.

Works under progress

- ✓ Laying of LT UG cables and LT service connections and street light cables
- ✓ Erection and commissioning work of DTs, Feeder pillars and Service pillars, Service connection works.HT dismantling works in two feeders (New Town-2 & Sellankuppam-9 feeder) are under progress.

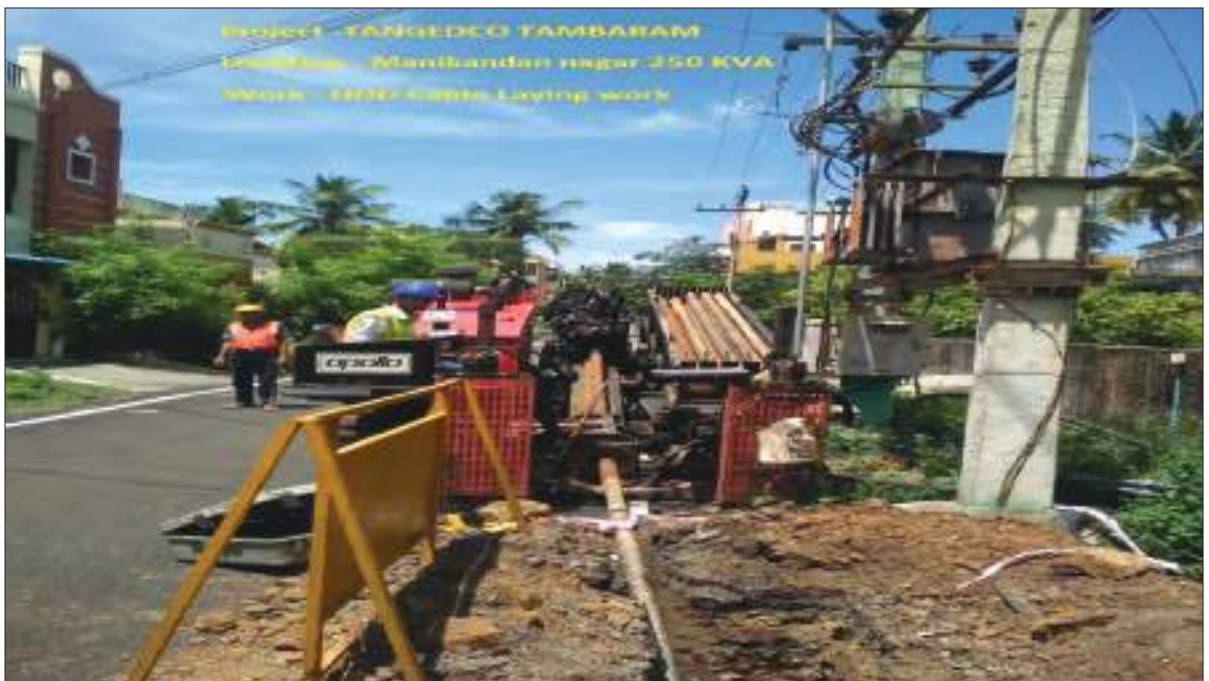
Supply progress – 99.07%

Erection progress – 90.56%.

Conversion of OH lines into UG Cables in Greater Chennai

In order to prevent occurrence of accidents and to have secured network, conversion of over head lines (OH) to underground cables (UG) have been taken up in the Chennai city and extended areas in 5 Divisions namely Perambur, Tambaram, Avadi, Adyar & IT Corridor for an estimated cost of Rs.1,011.31 crore covering 3,583.55 km of UG cable and 39,345 Nos. pillar boxes. The loan assistance has been obtained from Power Finance Corporation (PFC). Works are expected to be completed by September 2022.

Cable Laying Works – Tambaram Division



Cable Termination at Pillar Box – Adyar & ITC Division

1.4.12 Conversion of OH to UG in Delta Districts

Conversion of the 33 kV Overhead (OH) source lines between substations into underground cables initially in Delta districts of Tiruvarur, Nagapattinam, Thanjavur, Cuddalore, Villupuram and also in Coastal Ramanathapuram district for 219 kms covering 15 Nos. of feeders for an amount of Rs.210 crore. Works have been commenced and is expected to be completed by March 2023. Funding is yet to be tied up, sanction is awaited from REC.

1.4.13 Conversion of OH to UG in Coastal Area

It is proposed to replace 25 Nos of 33 kV source lines between the substations in Coastal areas of Thiruvallur, Chengalpattu, Tuticorin, Kanyakumari, Ramanathapuram (phase2), Tiruvarur (phase2), Nagapattinam (phase2), and Thanjavur (phase2), into 33 KV UG cables at an estimated cost of Rs.268 crore.

It is proposed to execute the scheme by availing loan from Asian Development Bank (ADB).

1.4.14 HT Strengthening works under UDAY scheme

The HT strengthening works are proposed for reduction of AT&C loss with funding assistance from REC. The cost of the project is Rs.860 crore. The progress achieved under this is furnished below:

S. N	Description	Quantity in kms	Progress in kms
1.	Erection of new 33/22/11 kV lines	3,150	933
2.	Replacement / Strengthening of existing 33/22/11 kV lines	10,250	1,864

1.4.15 Conversion of existing Distribution Transformer (DT) structures to Ring Main Units (RMUs) in Chennai and Sub-urban areas

In order to ensure maintenance free HT network and reliability of power supply by complete elimination of outdoor structure faults

that occur in conventional Distribution Transformer structures like insulator flash over, failure of AB switch contacts, jumper cuts, bird / squirrel faults, faults due to tree branch falling, etc., the existing conventional DT structures are to be replaced into Ring Main Unit (RMU) in Chennai city and its suburban area.

RMU occupies very less space compared to conventional structures, no live parts are exposed and facilitates easy identification of faulty section, hence rectification is made quicker. Moreover, On-load operations and load transfer in RMUs reduce interruptions.

The estimated cost is Rs.1,819 crore with funding from REC.

In the first phase, works have been awarded for erection of 5,692 Nos. of 11kV RMUs at a cost of about Rs.787.50 crore. The works are expected to be completed by July 2022.

Commissioning of RMU at Chepauk- Thiruvallikeni Constituency on 10.01.2022

Commissioning of RMU at Chepauk- Thiruvallikeni Constituency on 10.01.2022

1.4.16 Sub-Transmission & Distribution Program (ST & D)

TANGEDCO has planned to execute 103 nos. of substation schemes under ST&D programme, comprising of 59 nos. of New 33/11 kV SS and 44 Nos. of Augmentation (additional / enhancement of power transformers) of existing 33/11 kV SS at an estimated cost of Rs.373.55 crore with financial assistance from M/s. REC. Out of 103 nos. schemes, 64 nos. of schemes have been commissioned and works are under progress for the balance 39 nos. of schemes which are expected to be completed by 2022-23.

33/11 KV GUDALUR SS

1.4.17 Revamped Distribution Sector Scheme

1. The Revamped Distribution Sector Scheme is a Reforms Based and Results-Linked Scheme being taken up by TANGEDCO.
2. Objectives of the Scheme:
    - Improve the quality, reliability and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector.
    - Reduce the AT&C losses to the level of 11.92% by 2024-25
    - Reduce the ACS –ARR gap to zero by 2024-25

1.4.18 IT Initiatives

Year after year many IT initiatives are undertaken for hassle free and consumer friendly operations.

- Mobile App for Assessor for automatic downloading of Meter readings and Billing has been developed and completed for DLMS meters and is under testing. Further the App is under development to read non-DLMS meters.
- Online Application portal for new Agriculture Service Connection has been developed and completed. This will facilitate to apply online without need to visit local office.
- Facility has been extended to LT Consumers for applying ‘Name Transfer’ Online. Further the portal has been integrated with Registration portal for automatic registration for Name transfer.
- Online Application portal for GCRTS (Grid Connected Roof Top Solar) for domestic consumers under Central Financial Assistance (CFA) have been launched on 27.10.2021.

- Single payment gateway for all Net Banking has been enabled on 06.11.2021. This will facilitate consumers to pay through Net Banking having an account in any bank.
- Facility has been extended to send SMS for consumers acknowledging the Payment received with mode of Payment from consumer made at Counter by Cash, DD, Cheque or through Online from 01.10.2021.
- Facility has been extended to consumers to inform the dishonored Cheque status immediately by way of SMS from 22.11.2021.
- SMS is being sent to the Consumers from 07.03.2022, informing them with disconnected status, with Meter reading to enable them to make payment immediately.
- The LT Online Application portal has been integrated with GoTN Single Window portal under e-governance for Industrial Applicants.

- ❖ SAP Enterprise Resource Planning (ERP) is implemented from 05.05.2021 in TANGEDCO and TANTRANSCO. The major modules in ERP are
    - ✓ Materials Management
    - ✓ Project Systems
    - ✓ Plant Maintenance
    - ✓ Sales and Distribution
    - ✓ Human Capital Management
    - ✓ Finance and Control

The ERP is a fully integrated package which has the following advantages.

- The material life cycle from procurement to scrap of materials is tracked in ERP.
- Work Order creation and Asset Capitalization after completion of work and calculation of depreciation of Assets is done in a centralised system.
- The Employee Life Cycle from Recruitment to Retirement is tracked in ERP.

- IND AS System of Accounting is possible in ERP.
- Decisions on Material Management, Employee Management and funds and cash flow could be taken with real time data.

Proposed IT Initiatives

a) HT AMR DATA – Event Analysis and auto recovery of full revenue

An Intelligent Analysis Software has been developed in-house for Automatic analysis of Tamper events as the no. of events are in large and the verification of all the events by officials were very difficult and time consuming.

This system segregates the critical and non-critical events, closed and unclosed events, event duration etc. Based on the event duration of the billing events, the no. of units to be added in the bill is calculated and passed on to HT billing system automatically.

Approximately 2,00,000 units are being detected and added every month in the bills automatically through Intelligent Analysis software fetching a revenue of around Rs.12 lakhs per month.

b) MDAS – In – House – Event Analysis and Auto Recovery of Full Revenue

In order to have analysis of all the meters (AMR / Non-AMR), the in-house MDAS system is developed to analyse the event duration for HT billing.

Based on the event duration of the billing events, the number of units to be added in the bill is calculated and passed on to HT billing system for effecting auto recovery of revenue.

c) Transmission Loss accounting in Solar Generators

Due to fetching of reading from solar generator plant end, the transmission loss up to

the delivery point at interconnection substation was not accounted so far. Now a software has been developed for measurement of energy at substation end itself.

In new solar services, meters are being fixed to fetch readings from SS end itself instead of plant end.

d) Smart Meter Implementation under Chennai smart city project in T.Nagar ABD area

In order to eliminate human intervention for fetching of meter data and to facilitate disconnections / reconnection remotely, smart meters with radio frequency based communication technology has been proposed to be implemented for 1.41 lakh consumers under Chennai Smart City scheme's Area Based Development (ABD) in Thiyagaraya Nagar.

IT infrastructure, hardware and software have been procured for Rs.7.45 crore and

installation has been completed. As on 31.03.2022, 1,00,900 Nos. of Smart Meters have been installed communicating through installed HES software. MDMS software Development is under progress.

e) Geographic Information System (GIS)

The following facilities have been extended in GIS for better utilization of the system by officials.

Thiruvarur EDC – Agriculture

Default Consumers

The Assets & consumers of TANGEDCO for the entire State has been mapped in GIS. Nearly 3.17 crore consumers, 3.6 lakhs transformers and complete 1.66 lakh kms of HT & 5.25 lakhs kms of LT Network has been mapped.

- Consumer location search for identifying the premises by all the Officers for easy inspection.

- Mapping of defaulters in Map to know area where defaulters are more and take appropriate action.
- The generation of report for DT failure entry made by section officers is made easy.
- Integrated with HT new application software for identifying TANGEDCO administrative boundary.
- The following drill down report for computing have been provided.
  - ✓ Total Nos of Substations - voltage ratio wise (Circle wise)
  - ✓ Total Nos of HT Feeders (Circle wise)
  - ✓ Total Nos of Distribution Transformers (Circle wise)
  - ✓ Total HT network length (Region wise)
  - ✓ Total LT network length (Region wise)
  - ✓ Total Nos of Pole (Region wise)
  - ✓ Total Nos of LT Consumers. (Region wise)

- ✓ LT / HT Ratio – Section wise &
- ✓ HT Feeder wise (Region wise).

1.4.19 Electric Vehicle

The “Tamil Nadu Electric Vehicle Policy 2019” was issued by Government of Tamil Nadu vide G.O.(Ms) No.176 dt.09.10.2019. Energy Department is the Nodal department for ensuring public and private charging stations provided with all necessary facilities and incentives.

As per policy at least one charging station in a grid of 3 km x 3 km and 1 charging station at every 25 km on both sides of highways/roads. TANGEDCO has been appointed as the Nodal Agency for creating Public charging stations infrastructure for Electric Vehicles.

For charging at home the domestic connection can be used for charging their vehicles.

Private charging in case of Offices, Malls, Gated Community, etc. can be done through the

common supply with the commercial connection either LT or HT and appropriate tariff will be charged.

Dept of Heavy Industries, Ministry of Power, Government of India has accorded sanction for establishing 256 nos. of Public Charging Stations in Tamil Nadu under (Faster Adoption and Manufacturing of Electric Vehicles) FAME-II scheme to M/s. EESL, M/s. MTC, M/s. TNSTC, M/s. REIL. Till date, 11 nos of PCS has been installed by M/s. EESL in Chennai metro stations under this scheme and 8 nos. PCS are ready for commissioning in Chennai Metro Stations.

151 nos. of Charging stations have been installed across the State so far by various Public and Private Entities including Corporation of Chennai.

I. Activities of TANGEDCO as State Designated Agency (TNSDA) for energy conservation

- In order to conserve electrical energy by way of retrofitting of energy efficient appliances in the rural villages, 2 Nos. Model Villages (Othayal & Karenthal) in Ramnad and Virudhunagar districts have been identified by BEE.
- In order to inculcate Energy Conservation (EC) awareness in the agricultural sector, it is proposed to conduct training for farmers across the State. To start with, the above training was conducted on 23.02.2022 addressing the farmers in Nagapattinam EDC.
- In order to reduce energy consumption in commercial buildings and to make the buildings energy efficient, the final draft Energy Conservation Building Codes and

Rules, 2021 have been prepared as per the guidelines of Bureau of Energy Efficiency(BEE) and adopted. The same has been submitted to GoTN for notification.

- 86 industries identified by BEE under various cycles (PAT) are under monitoring and verification.
- **76 nos.** of Energy clubs were formed during October 2021 in Government High Schools and Higher Secondary Schools in Kanchipuram and Chengalpattu districts with an enrolment of 2,895 students, to create awareness on energy conservation among the students.

  Further, it is proposed to form **51 nos.** of Energy clubs in Government High Schools and Higher Secondary Schools in Chennai and Tiruvallur districts, to create awareness on energy conservation.
- In order to ensure the availability of BEE's Star labelled electrical appliances in the

major sales outlets across the State, periodical inspection and monitoring are being carried out.

1.4.20 Research and Development

- Obtaining NABL Accreditation for the Meters, Current Transformers (CTs) and Potential Transformers (PTs) testing labs have been setup at a cost of Rs.30 lakhs (approx.) at Chennai, Tirunelveli and Udumalpet.
- Proposed to setup a new transformer Oil testing laboratory at Madurai at an estimated cost of Rs. 2.0 crore (approx.) excluding the land and building cost.
- Implementation of new technologies for monitoring the condition of electrical equipment in substations which increase the lifespan of the equipment, thereby ensuring uninterrupted power supply to public.

- A study titled “Comprehensive Condition Monitoring Techniques for Lightning Arresters of EHT/ HT Substations using Third Harmonic Leakage Current Measurement, Infrared Thermography in Live Condition and off line HV Watt Loss Test” has been completed with a grant of Rs.170 Lakhs (Rupees One Hundred and Seventy Lakhs only) from State Planning Commission (SPC)/ GoTN under Tamil Nadu Innovation Initiatives (TANII) scheme.
- For the first time in the history of TNEB such a comprehensive on line and off line testing facilities have been introduced for seamlessly monitoring the condition of the EHT station class surge arresters.

1.4.21 Re-Organisation of Regions

In order to bring out the balancing in work, administration process and also to provide better and uninterrupted reliable power Supply, as well

as to redress the grievances of consumers, the Hon'ble Minister for Electricity, Prohibition and Excise on the floor of Assembly announced that three (3) new Distribution Regions will be formed.

Accordingly, Orders were issued vide BP No. 1 Dated 25.01.2022, for formation of 3 regions namely Karur, Thanjavur and Thiruvannamali and was inaugurated by the Hon'ble Chief Miister of Tamil Nadu on 16.04.2022.

The Hon' ble Chief Minister of Tamil Nadu on 16.04.2022 in the function held at TANGEDCO Headquarters, Anna Salai inaugurated the newly formed Thanjavur, Thiruvanamaalai, Karur and Kanchipuram Regions by video conference.

1.4.22 Sustainable Development Goals (SDGs)

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides for peace and prosperity for people and the planet, now and into the future. The SDGs constituted through an unprecedented consultative process, have 17 goals and 169 related targets to be achieved by 2030. It has been indicated that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth along with tackling climate change and preserve our oceans and forests.

- In order to plan, implement, monitor and review the SDG in Tamil Nadu, a High-Power Committee has been constituted under the Chairmanship of Chief Secretary with 8 working groups under the Chairmanship of Secretaries to Government

- Goal 7 pertaining to Energy Department which comes under Working Group 5 “Innovation, Industrialisation and Sustainable Development”, for which, Chairperson is Principal Secretary to Government, Industries department.
- To monitor the status of indicators, a dashboard has been created by GoTN, in which the values are being entered regularly.

Indicators have been fixed for the above goals and action is being taken towards achieving these goals. Tamil Nadu shares the second rank along with Himachal Pradesh in overall ranking.

The main goal pertaining to TANGEDCO is Goal 7, “Affordable and clean energy”. As far as Goal 7 is considered, Tamil Nadu is an achiever with a score of 100.

1.5 Finance

I. TANGEDCO

- TNEB has been incurring continuous losses over the years due to increase in fuel cost, expenses towards purchase of power from private generators, interest on loans, employees benefit expenses etc. But, the recovery of power supply cost through tariff was also not given effect for the past 8 years.
- Revenue Account for the past four (4) years are as below:

(Rs. in crores)

Elements	2018-19	2019-20	2020-21	2021-22
Total Revenue	61,666.73	65,177.10	63,388.52	72,096.39
Total Expenditure	74,290.14	77,142.03	76,795.84	83,310.03
Revenue Loss	-12,623.41	-11,964.93	-13,407.32	-11,213.64

- TANGEDCO borrowed loans from Financial Institutions / Banks to meet capital and

revenue expenses occurring every month. However, the Annual outstanding loan amount is limited to Rs. 1,39,226 crore, as the Government of Tamil Nadu has supported TANGEDCO with loss funding assistances.

- Rationalisation of tariff categories prevailing at present need to be initiated as a reform process, so as to improve revenue efficiency in TANGEDCO. The present level of Average Rate of Realisation (ARR) and Average Cost of Supply (ACS) are as below:

Elements	2018-19	2019-20	2020-21	2021-22
Units Input (Million units)	76,126	77,391	73,622	81,298
ARR (Rs per unit)	6.04	6.35	6.56	6.96
ACS (Rs per unit)	8.29	8.49	9.00	8.90
Gap between ARR and ACS (Rs. per unit)	-2.25	-2.14	-2.44	-1.94

- In order to further improve the billing and collection efficiency, efforts are being taken to install Smart meters, replace the defective meters, ensure 100% assessment, disconnect the defaulted services, control improper use of energy, enhanced online payment usage, etc.
- TANGEDCO has facilitated its consumers to make payment of current consumption charges through various modes viz., TANGEDCO counter, net banking, Bharat Bill Payment System, e-Seva centre, Post office, Payment Gateways, Debit Card/Credit Card, bank counter, ATMs, etc. TANGEDCO has collected 74% of the total revenue through digital mode of collections. In view of the above facilities extended to the consumers, the TANGEDCO's collection efficiency always stood at more than 99%, which is highest in the country. National Automated Clearing House (NACH) has been enabled for making

payment by Local bodies in a centralised manner.

- With an aim to improve the financial position of TANGEDCO, it has been proposed to take up effective cost cutting measures such as restricting high-cost power purchase, Proper usage of fuels in generating stations, planned maintenance of plants & Equipment, Prudent conservation of Energy, etc.
- TANGEDCO has initiated negotiations with Financial Institutions such as REC, PFC, TNPFC, etc and Commercial Banks to reduce the interest rate to 9% per annum on the existing outstanding loans as well as on the fresh loans at competitive interest rates. Accordingly, there has been reasonable savings in interest expenses attained. Further, mobilisation of funds through the issue of Bonds on Private Placement basis at lower coupon rate is under process for

swapping of high cost loans to save interest burden, further.

II. TANTRANSCO

The main business of TANTRANSCO is the transmission of electricity. TANGEDCO is the major customer which contributes to about 80% of the total revenue of TANTRANSCO.

- TANTRANSCO has incurred losses during the past 7 out of 10 years due to which the accumulated losses have increased to Rs.6,796.34 crore as on 31.3.2021. The budgeted losses for the current financial year 2021-22 has been estimated as Rs.1,778.17 crore.
- The year-wise Revenue account for the past 11 years are as below:

(Rs. in crore)

Financial Years	Revenue Receipts	Revenue Expenditure	Revenue Gap
2011 – 12	1,744.85	1,744.85	0
2012 – 13	2,414.95	2,178.51	236.44
2013 – 14	2,877.11	1,569.07	1,308.04
2014 – 15	1,936.21	2,049.15	-112.94
2015 - 16	2,507.08	2,770.48	-263.40
2016 – 17	2,578.07	2,853.02	-274.94
2017 – 18	2,781.85	7,447.98	-4,666.14
2018 – 19	3,224.63	3,859.54	-634.91
2019 – 20	3,366.22	4,440.70	-1,074.48
2020 – 21 (Provisional)	3,391.06	5,141.62	-1,750.56
2021-22 (Budgeted figure)	3,287.47	5,065.64	-1,778.17

The loans outstanding in the past 11 years are as below:

(Rs. in crore)

Years	Loans outstanding
2011 - 12	10,156.20
2012 - 13	8,253.72
2013 - 14	9,338.13
2014 - 15	10,710.10
2015 - 16	9,998.48
2016 - 17	13,298.24
2017 - 18	16,184.18
2018 - 19	18,869.31
2019 - 20	23,099.11
2020 - 21	25,612.85
2021-22	27,637.73

- In order to improve the financial position of TANTRANSCO, it has been planned to take up measures on cost control aspects such as savings in interest on loans, reduction of expenditure in certain controllable areas etc.

1.6 SAVINGS ACHIEVED

The Tamil Nadu Generation and Distribution Corporation Ltd., has incurred a loss of Rs.13,407.32 crore during the financial year 2020-21. As a result of the continuous efforts of the Government of Tamil Nadu in cost cutting and revenue augmentation measures the revenue for the year 2021-22 has increased considerably.

In spite of being in critical financial position, in order to maintain uninterrupted and quality power supply to the public of Tamil Nadu, TANGEDCO continues to execute capital programmes to strengthen its Distribution infrastructure and network.

Further, though TANGEDCO has availed loans at higher interest rates to meet the increased cost of fuel, employee related cost, cost of materials and revenue shortfall, due to continuous efforts taken by TANGEDCO for reduction of the interest rate for its loans, the interest commitment for the current financial year 2021-22 has been restricted and maintained at the same level of Rs.13,000 crore.

2. TAMIL NADU ENERGY DEVELOPMENT AGENCY

2.1 Introduction

The State of Tamil Nadu is rich in Renewable Energy (RE) sources, especially wind and solar. Globally, observations point towards a changing climate, as temperatures are increasing, sea levels are raising, with a perceptible increase in severity and frequency of extreme events. Its most severe impacts may still be avoided if efforts are made to transform current energy systems. Renewable energy sources have a large potential to displace emissions of greenhouse gases from the combustion of fossil fuels and thereby to mitigate climate change.

The Government of Tamil Nadu is committed to mitigate the climate change effects on the one hand and to tap and judiciously use the abundant source of RE on the other hand. To promote the use of New and Renewable Energy Sources and

promote energy conservation activities, the Government of Tamil Nadu set up the Tamil Nadu Energy Development Agency (TEDA) in 1985.

Besides promoting and creating awareness on RE, TEDA is also acting as a bridge between small RE consumers and RE integrators to enhance renewable energy contribution in the overall energy mix in the State grid. Being the State Nodal Agency for the Ministry of New and Renewable Energy (MNRE), TEDA has facilitated implementation of RE projects with a cumulative capacity of 74.28 MW of medium and small level projects which include 57.28 MW in domestic rooftop solar PV systems and 17 MW of wind projects.

2.2 Tamil Nadu's Power in Renewable Energy

Tamil Nadu is at the forefront of India's renewable energy (RE) transformation. The State has long been a leader in wind energy, accounting

for around 25% of the national capacity, and has a target to deploy 9 GW of solar photovoltaic (PV) capacity by 2023.

The Government intends to make renewable energy a people's movement. The State is blessed with various forms of renewable energy sources which are perennial in nature, available locally and quite suitable for decentralized applications.

The total renewable energy potential is over 720,000 MW (including grid-connected and off-grid power), according to World Institute of Sustainable Energy (WISE). Installed Capacities of various power plants in Tamil Nadu as on 01.03.2022 are as follows:

Power Plants	Capacity in MW
Total conventional	16,166.67
Hydro	2,321.90
Wind	8,606.52

Solar	4,986.01
Biomass	262.59
Co-gen	721.90
TOTAL	**33,065.59**

Source- TANGEDCO

In India, Tamil Nadu is the only State where half of the installed capacity is from renewable sources. Tamil Nadu's higher percentage of renewable energy is attributed to its geographical conditions that are suitable for harnessing renewable energy sources.

The Government is taking proactive steps to tap various sources of energy through policy framework.

2.3 Government of Tamil Nadu's Initiative to Promote Renewable Energy

2.3.1 Solar Village

The Tamil Nadu Government had approved setting up of a 170 kW grid-connected solar

power plant in Irumbai village as a model 'Solar Village' in Vanur Taluk of Villupuram District to demonstrate the concept of sustainable energy secured rural habitation with net zero carbon emission. TEDA invited bids to design, install and commission the solar PV plant in Irumbai, which is expected to be completed by June 2022. The pilot, on successful implementation, is expected to inform future replication and scale up of the concept of using solar energy as a lever to create sustainable rural communities. The project is being implemented through TANII fund support at a project cost of Rs.2.00 crore.

2.3.2 Implementation of KUSUM in Tamil Nadu

The Solar energy producing farmers scheme under the PM-KUSUM Component C for solarising 20,000 nos. of grid connected agriculture pumps will be implemented effectively. Under this scheme, the farmer is treated as RESCO operator

so as to realize revenue from the entire units generated by him through solar panels at the rate of tariff fixed by Tamil Nadu Electricity Regulatory Commission besides getting incentive at the rate fixed by Tamil Nadu Electricity Regulatory Commission for the net energy exported by him to the grid. Under the scheme, Central Financial Assistance of 30% of the capital cost of the unit or the benchmark cost announced by the MNRE, whichever is lower, and another 30% as State Financial Assistance is provided to the willing farmers for solar plant capacity up to 11 kW. The balance 40% of the plant cost is borne by the farmer.

2.3.3 Solarisation of Government Buildings

The Tamil Nadu has set a target of 9,000 MW cumulative installed solar energy capacity to be achieved by the year 2023. The overall solar energy target is divided into targets for the utility

category solar (5,400MW) and the consumer category solar (3,600 MW).

In order to achieve the 2023 consumer category solar energy target, TEDA has been installing solar rooftop system either financed through Capital Expenditure (CAPEX) model or through a Renewable Energy Service Company (RESCO) model. The majority of installations till date are financed through the CAPEX model but the RESCO model is on the rise.

TEDA has already facilitated the installation of solar power plants in the Government buildings under CAPEX model during 2020-21. The following is the partial list of Government office buildings / Secondary and Higher Secondary schools in which solar rooftop PV systems have been successfully implemented:

Sl. No	Government offices / School Buildings	Capacity in kW
1	Periyar University, Salem	300
2	Zonal Transport office North & West, Chennai	20
3	Tamil Nadu Warehouse corporation	22
4	V.O.C Port Trust, Thoothukudi	140
5	332 Secondary and Higher Secondary Schools in various Districts	1259
6	Tamilnadu Medicinal Plant Farms and Herbal Medicine Corporation Limited (TAMPCOL), Chennai	110
7	Highways Research Station, Chennai	65
	Total	**1916**

Under RESCO model, works have been completed for a cumulative capacity of 926 kW and are under progress for a cumulative capacity of 538.875 kW in various Government departments.

A cumulative capacity of 8.397 MW potential has been identified in various Government departments for the installation of Solar Power Plants under RESCO & CAPEX models for the year 2022-2023.

2.3.4 Solar Rooftop Program for Domestic Consumers (GCRTS Phase-II)

TEDA has been nominated as implementing agency for phase-II of Grid Connected Rooftop Solar programme of MNRE, to install solar rooftop plants for a cumulative capacity of 12 MW for domestic consumers with eligible central finance assistance of MNRE. The eligible subsidies will be arranged to be reimbursed as below:

Type of Residential Sector	**Central Financial Assistance(CFA)** **(as percentage of benchmark cost or cost discovered through competitive bidding process, whichever is lower)**
Residential sector (maximum up to 3 kW capacity)	40 %
Residential sector (above 3 kW capacity and up to 10 kW capacity)	40% up to 3 kW plus 20% for above 3 kW and up to 10 kW.
Group Housing Societies/Residential Welfare Associations (GHS/RWA) etc. for common facilities up to 500 kW (@ 10 kW per house), with the upper limit being inclusive of individual rooftop plants already installed by individual residents in that GHS/RWA at the time of installation of RTS for common activity.	20%

2.4 Renewable Energy Strategies for Sustainable Development

To accelerate the growth rate of renewable energy in the generation mix and to mitigate the arising challenges thereupon Tamil Nadu Government will devise and implement the following measures:

- Increased prioritization of clean energy projects and promotion of policies that support renewable energy
- Demand side reforms to promote electric vehicles.
- Incentivizing power generated from renewable energy sources through subsidies.
- Pursue action with Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) to segregate agriculture feeder and explore options to connect the

same with solar power to reduce subsidy burden on agriculture power supply.

- Tamil Nadu Renewable Energy Park (P) Ltd., (TREP), a Special Purpose Vehicle, has been formed as a subsidiary company of TEDA with main objective to implement New and Renewable Energy projects. TREP will carry out the business of Electric power generation and aggregation of all Renewable Energy sources.
- State Government Departments and State Public Sector Undertakings (PSUs) will be encouraged to participate in annual solar energy and energy conservation training programs organized by TEDA and other agencies.
- TEDA will lead a comprehensive information and awareness creation effort in order to promote solar energy in the State.

- TEDA will provide project development and technical advice and assistance to implement solar energy projects.
- TEDA shall coordinate with State Government Departments and Public Sector Undertakings to facilitate extensive adaptation of solar energy plants.
- In regard to Sustainable Development Goal(SDG) TEDA will assist TANGEDCO for attaining Affordable and Clean Energy indicators like households electrified in remote area with solar grid, increase the renewable energy share in the total installed capacity and reduce the AT & C losses by installing decentralised Solar power plants.

2.5 Proposed Schemes Envisaged by TEDA

The realization of 20,000 MW of power from RE sources, as announced by the State Government, will be supported by innovative implementation of the following programs:

1 Solar energy programs for consumer category for a diverse set of electricity consumers including Government offices, educational institutions and places of worships.

2 TEDA will establish utility category solar projects through its own funds to cater to State run industry units in partnership with beneficiaries.

3 Scaling up of sustainable and energy secured rural habitations with net positive energy in line with TEDA's ongoing demonstration project on developing a solar village at Irumbai, Vanur Taluk, Villupuram District.

4 Adequate and accessible electric vehicle (EV) charging infrastructure is a necessary precondition for the mass adoption of EVs. Government of Tamil Nadu has also notified Industries, Energy and Transport Departments as nodal Agencies for the

implementation of this policy in the State. TEDA has proposed solar powered EV charging stations at the Secretariat and Directorate of Public Instruction (DPI) complex. The State Planning Commission has accorded approval for the project and the charging stations will be established through TANII fund support at a project cost of Rs.1.50 crore.

ELECTRICAL INSPECTORATE

3.1 INTRODUCTION

The Electrical Inspectorate under Energy Department is one of the oldest Government Organizations serving the Public since the Indian Electricity Act, 1910 came in to effect. The Electrical Inspectorate bears a responsibility to ensure protection of person and property against electrical hazards by enforcing safety provisions laid out in the national laws on Electricity and laws related to Bureau of Indian Standards (BIS).

The Electrical Inspectorate is also entrusted with the enforcement of safety provisions relating to lifts, escalators, & cinemas and levy & collection of electricity tax under various State laws.

3.2 SERVICES RENDERED BY ELECTRICAL INSPECTORATE

3.3 STATUTORY FUNCTIONS, ROLES & RESPONSIBILITIES

3.3.1 Electrical Installations

The safety requirements for an electrical installation are covered by the Central Electricity Authority (Measures relating to Safety & Electric Supply) Regulations, 2010 made under section 53 of the Electricity Act, 2003. The Electrical Inspectorate inspects and certifies all electrical installations receiving HT supply, power plants, generators, and multi-storeyed buildings to ensure compliance of these regulations and also conducts periodical inspections to verify satisfactory maintenance of electrical installations.

The Inspectorate investigates electrical accidents and suggests remedial measures/

recommendations to avoid such incidents in future.

The Electrical Inspectorate also inspects and certifies temporary electrical installations put up in connection with the visit of VVIP's namely the Hon'ble President, Hon'ble Vice President, Hon'ble Prime Minister, Hon'ble Governor, Hon'ble Chief Minister and other Public functions where large number of people are likely to assemble to ensure electrical safety.

3.3.2 Cinema Installations

The safety requirements specifically applicable to cinemas are stipulated in the Tamil Nadu Cinemas (Regulation) Act, 1955 and Rules, 1957. Under these Rules, the Inspectorate carries out the following duties to ensure safety to the Cinemagoers:

a) Issue of Drawing Approval for electrical installations of cinema premises

b) Inspection and Issue of Electrical Certificate for all Cinema Theatres
c) Annual Inspection of Cinemas

3.3.3 Lifts and Escalators

The Government of Tamil Nadu enacted the Tamil Nadu Lifts Act, 1997 to regulate erection, maintenance and safe working of Lifts. Subsequently by an Amendment Act in 2017, the Escalators were also included.

Under the Tamil Nadu Lifts and Escalators Act, 1997 and Rules framed there under the Inspectorate carries out the following activities:

a) Issue of Erection Permission for Lifts & Escalators
b) Inspection and Issue of Licenses for commencement of the working of Lifts & Escalators

c) Periodical Inspection & Renewal of Licenses for safe working of the Lifts & Escalators, and

d) Issue of Authorization to the Companies carrying out erection, maintenance, inspection and testing of Lifts and Escalators.

3.3.4 Electricity Tax

The Tamil Nadu Tax on Consumption or Sale of Electricity Act, 2003 (Tamil Nadu Act No.12 of 2003) was enacted in 2003 to consolidate and rationalise the laws relating to the levy of tax on consumption or sale of electricity in the State of Tamil Nadu, repealing the Tamil Nadu Electricity Duty Act, 1939 and the Tamil Nadu Electricity (Taxation on Consumption) Act, 1962. The Act came in to force with effect from 16th June, 2003.

The Government has entrusted the collection of tax on consumption of electricity from captive

generators and IEX purchase under section 3(1) (b)&(c) of the Tamil Nadu Tax on Consumption or Sale of Electricity Act 2003 to TANGEDCO.

3.3.4. a. The Government has notified the following rates of electricity taxes for sale or consumption of electricity:

S. No.	Category	Rate of Tax	Tax collected by
1	Electricity sold by Licencee (TANGEDCO/Independent Power Plants / Traders) to consumers	5% on the Consumption Charge	TANGEDCO
2	Electricity Sold by Captive Generating Plants to Consumers	5% on the Consumption Charge	Electrical Inspectorate
3	Consumption of Electricity from Captive Generating Plants including standby Generators (DG sets) for Own Use & IEX purchase	10 paise per unit of electricity consumed	TANGEDCO

3.3.4. b. The following are exempted from levy of electricity tax:

1) Electricity sold to Government, Local Authority and Railways.
2) Electricity sold for agricultural purposes and hut service connections.
3) Electricity sold to Domestic consumers by Licencee (TANGEDCO).
4) Electricity sold to the TANGEDCO.
5) Exemptions granted under various policies such as Special Economic Zone Policy, Industrial Policy, Solar Policy, Data Centre Policy, Electric Vehicle Policy, etc.

3.3.5 Government Electrical Standards Laboratory:

The Government Electrical Standards Lab attached to the Office of the Chief Electrical Inspector to Government is a prestigious and forerunner laboratory providing calibration and

testing services for consumers, suppliers of electricity, generating companies and electrical contractors.

In order to deliver world class calibration service, the Government has allocated a total of Rs. 1.5 crores for purchase of precision calibration equipment. Most of the equipment have been procured, installed and successfully commissioned during 2020-2021. The Government has re-allocated Rs. 10 lakhs during 2021-2022 to obtain National Accreditation Board for Testing and Calibration Laboratories (NABL) accreditation for the lab. The application for accreditation of lab has been filed and audit for compliance of ISO 17025 is awaited.

High Precision Automatic Smart Electric Meter Test Bench procured, installed and commissioned during 2021.

3.3.6 Electrical Licensing Board

As per regulation 29 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010, all the electrical installation works can only be carried out by the licensed contractors and workmen. The Electrical Licensing Board under the Electrical Inspectorate has been designated as THE competent authority

to issue licence to the electrical contractors and to grant certificate of competency to wiremen and supervisors in order to ensure that all the electrical works are handled by licensed contractors and certified personnel. The electrical contractor licenses are classified as ESA, EA, ESB and EB grade depending upon the competency in handling voltage level.

3.3.7 Number of Electrical Contractor Licenses and Competency Certificates issued up to March 2022.

S.No	License / Competency Certificate	Numbers
1.	Electrical Contractor Super "A" Grade License	457
2.	Electrical Contractor "A" Grade License	2483
3.	Electrical Contractor Super "B" Grade License	2622
4.	Electrical Contractor "B" Grade License	21989
5.	Supervisory Competency Certificate	58611

S.No	License / Competency Certificate	Numbers
6.	Wireman Competency Certificate	148488
7.	Wireman Helper Competency Certificate	27811
8.	Power Generating Operator License	376

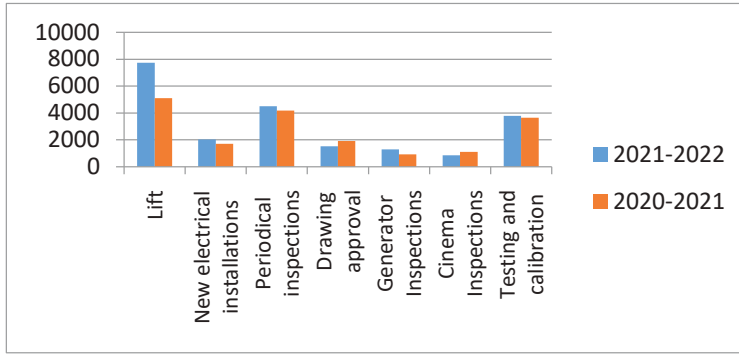
3.4 PERFORMANCE

3.4.1 The performance of the Department for the year 2020-2021 and 2021-2022 is as follows:

Sl. No	Services Rendered by TNEI	2020-21	2021-22
a)	Lifts		
	(i) Issue of licences for new lifts	1,938	2,153
	(ii) Renewal of licences for the existing lifts	3,171	5,589
(b)	Issue of permissions for electrical installations under Regulation 43	1,703	2,025
(c)	Statutory Periodical inspections of High-Tension installations under Regulation 30	4,178	4,496

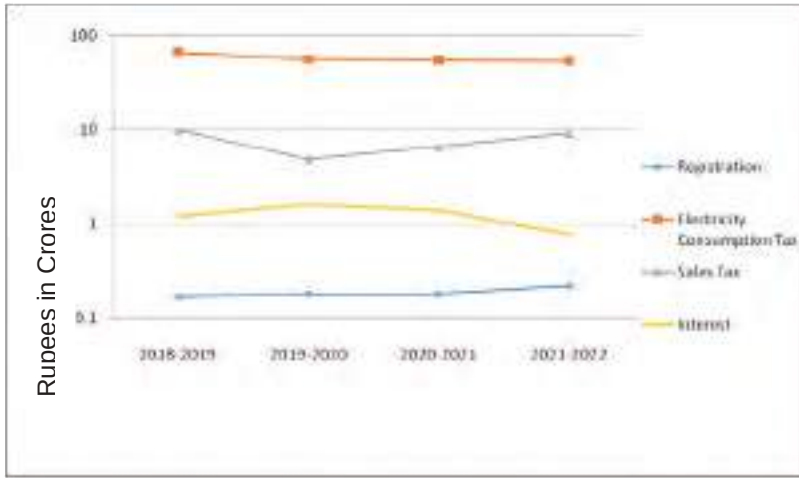
(d)	Scrutiny of drawing proposals for the new Electrical Installations and additions/alterations of equipment in the existing installations	1,918	1,522
(e)	Issue of permissions for generating units under Regulation 32	934	1298
(f)	Issue of permissions for Multi Storeyed Buildings under Regulation 36	86	173
e)	Cinema Theatres		
	(i) Existing cinema theatres	1,102	856
	(ii) Certification of Electrical Fitness to new cinema buildings	16	32
	(iii) Renewal of certification of Electrical Fitness to existing cinema buildings	320	313
(f)	Testing and calibrations of electrical meters	3,649	3,787

3.4.2 Bar chart – Performance of TNEI



3.4.3 REVENUE

I. Tax Collected by Electrical Inspectorate:

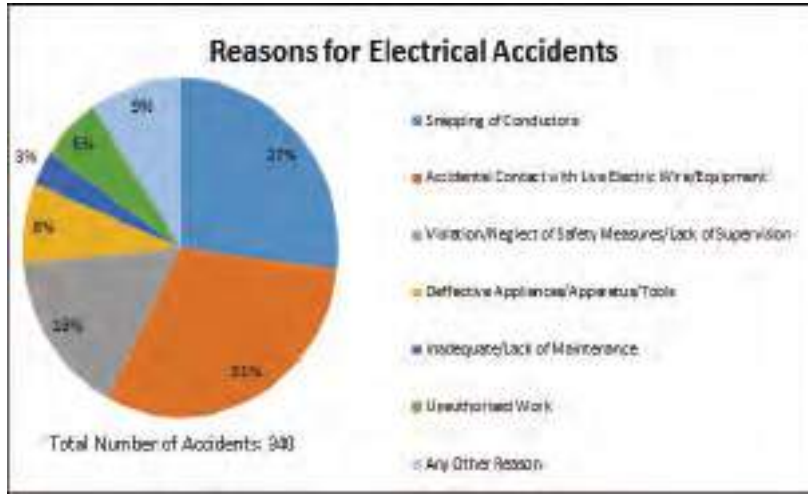


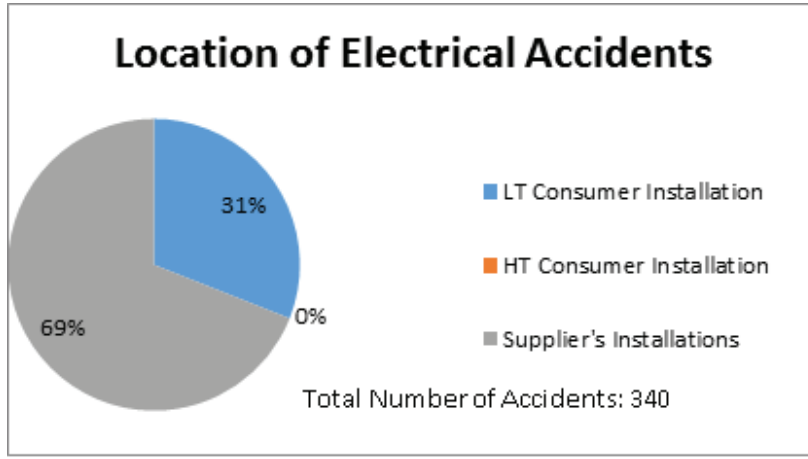
II. Tax collected by TANGEDCO Limited:

Tax collected by TANGEDCO Ltd	Total amount collected (Rupees in Crores)	Amount deposited into Government account (Rupees in Crores)
2018-2019	1279.29	441.54
2019-2020	1266.04	372.00
2020-2021	1102.09	400.00
2021-2022 (upto Dec 2021)	1004.29	400.00

However, the arrears of E-Tax due from the TANGEDCO upto December 2021 is Rs.3143.69 crore. The interest for belated payment of E-Tax calculated upto March 2022 is Rs.925.08 crore.

3.4.4 ANALYSIS OF ELECTRICAL ACCIDENTS OCCURRED DURING 2021-22





3.5 E-GOVERNANCE

The Electrical Inspectorate website https://www.tnei.tn.gov.in is a highly functional, citizen-centric portal that delivers digital content of all information needed by a citizen. This website is provided with an intuitive content management system to immediately share latest information to all category of users. The website hosts additional information which are to be voluntarily disclosed under the Right to Information Act, 2005. All the offices of this department are provided with internet connectivity with necessary ICT infrastructure for online delivery of various services of the Department.

"Online Lift and Escalator License Management'' system has been implemented in this department since 2017. It enables an applicant seeking grant of new licence and renewal of licence for lift and escalators to apply

online, monitor the status of his/her application and receive licence online seamlessly.

S. No	Service Rendered Online from August 2017 to till 31.03.2022	Nos.
1.	No. of licenses issued for new Lifts	9125
2.	No. of licenses renewed for lifts	30377
3.	No. of licenses issued for new escalators	370

“Online Filing of Returns of Electricity Tax” has also been implemented throughout the State of Tamil Nadu.

S. No	Service Rendered Online from August 2017 to till 31.03.2022	Nos.
1.	No. of requests for New Generators Registrations	5825
2.	No. of requests for re-registration of Generators	909
3.	No. of requests for tax filing	18158

3.6 EASE OF DOING BUSINESS & BUSINESS REFORMS ACTION PLAN

As part of commitments towards ease of doing business and ease of living for the citizen, the following services of this department are launched as end-to-end e-service delivery through single window portal, namely i) Drawing Approval, ii) Safety Certificate, iii) Registration of Generators, iv) Permission to erect Lifts, v) Licence for commencement of working of Lifts, vi) Renewal of Licences for safe working of Lifts and (vii) Permission for making additions/alterations to existing lifts.

Under the Business Reform Action Plan, identification of archaic laws, simplification of forms, notification of voltage and capacity under regulations for reducing regulatory burden, increasing the periodicity of inspections, identification of services for complete e-service

delivery, etc., are being implemented in a phased manner.

3.7 FUTURE SCENARIO

The Electrical Inspectorate dedicates itself to the advancement of technology with focus on time bound service delivery, and is re-evaluating its functions and responsibilities in line with the progressive and transformational reforms brought out by the Government for the benefit of citizens.

4. Tamil Nadu Power Finance and Infrastructure Development Corporation Limited (TNPFIDCL)

4.1 Introduction

The Tamil Nadu Power Finance and Infrastructure Development Corporation Ltd., (TNPFIDCL) was incorporated on 27.06.1991 as a wholly owned State Public Sector undertaking and registered as a Non-Banking Finance Company (Deposit)with Reserve Bank of India.The Company is classified as a Public Financial Institution by the Ministry of Company Affairs, Government of India on 09.01.2007. The company mobilizes funds primarily through public deposits and has been funding Infrastructure projects undertaken by TANGEDCO. The company's Paid-up Capital is Rs.3767 Cr. as on 28.02.2022.

4.2 Borrowings:

The borrowings are in the form of Fixed deposits which are mobilized from public, Institutions, Government departments and the State Government Schemes such as Cash Incentive Scheme, Bread-winning Scheme, Chief Minister's Girl Child Protection Scheme, Oru Kala Pooja Scheme and Covid-19 Scheme. Even at time of Covid-19 pandemic situation, the steady growth of deposits was possible due to focused policies and attractive interest rates on term deposits during the financial year 2021-22.

4.3 Rate of Interest:

The company offers on an average of 200 basis points more than the interest rates offered by the public sector banks. TNPFIDCL offers an attractive interest rate of 7.00% on term deposits for one year, 7.25% for deposits for 2 years, 7.75% for deposits for 3 years and 4 years and 8% for tenure up to 5 years. The Company offers

an additional interest of 0.25% p.a. for one year and twoyears and 0.50% p.a. for 3to5years term deposits for senior citizens of age of 58 years and above. This Corporation has mobilised thedeposits ofRs.35,640.67 crore as on 28.02.2022 (previous year 2020- 21 is Rs.34,445.68 crore).

4.4 Loans:

The Company's main objective is to fund infrastructure projects. Since inception, the Company is funding to TANGEDCO for generation of Power and taking up related projects. The funding is by way of long-term and short-term loans and the total amount funded up to 28.02.2022 is Rs.1,81,216.99 Cr. The net loan outstanding from TANGEDCO is Rs.42,190.14 Cr as on 28.02.2022.

4.5 Software:

TNPFIDCL has been upgraded the Core Banking Financial Service software application in

line with the RBI's IT Policy Framework and Directives. TNPFIDCL is offering 24 hours a day and 7 days a week through Web Portal. Further, TNPFIDCL has established a Customer Support Desk with the new age digital tools for depositors' services request namely E-mail with fresh desk ticketing system, WhatsApp, Video call - KYC update, Interactive Voice Response(IVR) which have paved the way for better Customer service.

4.6 Financial Performance:

The sound financial and professional management of the Company has led it to continue as a profit-making Company since its inception. The total revenue of this Company during the financial year 2021-2022 was Rs.4,269.68 Crore (Provisional)as against Rs.3,883.42 Crore during financial year2020-21. The company has earned a Net profit after tax of Rs.679.70Crore (provisional) during the financial year 2021-22 as againstRs.396.34 Crore during

financial year 2020-21. In order to maintain Capital to Risk Weighted Assets Ratio (CRAR)as the exemption granted to Government companies, in this regard has been withdrawn by RBI. The dividend has not been declared for the years 2019-20, 2020-21 and 2021-22.

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