ENERGY DEPARTMENT

POLICY NOTE

2014-2015

DEMAND No.14

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Minister for Electricity, Prohibition and Excise

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ENERGY DEPARTMENT

Introduction

Energy security is the foundation stone of the modern industrial economy. Access and availability of electricity is a powerful engine of economic and social development. This policy document elaborates programmes and policies of the government for ensuring supply of electric energy commensurate with the growth in demand.

The Honourable Chief Minister has released the Document, Vision 2023, outlining the outcomes targeted to be achieved by the year 2023. The macro objectives have been developed into executable projects in the strategic plan for infrastructure development in Tamil Nadu. The second volume of vision 2023 document profiles projects for setting up of an additional 20,000 MW of power generating capacity. The Plan lays emphasis for development of incremental

capacity of 10,000 MW of green power. Significant investment in transmission sector for creating evacuation capacity in proportion to the capacity addition in power generation has also been envisaged.

Honourable Chief Minister vision is to make generation and use of solar energy a peoples movement as was done in the case of rain water harvesting. Innovative programmes for promotion of solar generation at the place of consumption are being implemented by many departments. Execution of projects for installation of solar rooftop generation has also been included in the guidelines of MLA Constituency Development Fund.

The policy note covers the details of programmes and policies of the Government, relating to the power sector in Tamil Nadu.

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

I. Erstwhile Tamil Nadu Electricity Board which has been reorganized as,

   i) TNEB Limited

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

   iii) Tamil Nadu Transmission Corporation Limited (TANTRANSCO) and

II. Tamil Nadu Energy Development Agency (TEDA)

III. Chief Electrical Inspector to Government (CEIG)

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

TNEB Limited

Tamil Nadu Generation and Distribution Corporation Limited and

Tamil Nadu Transmission Corporation Limited

Tamil Nadu Electricity Board (TNEB) was formed in 1957 under section 54 of the Electricity (Supply) Act 1948 in the state of Tamil Nadu as a vertically integrated utility responsible for generation, transmission and distribution of power. The electricity network has since been extended to all villages and towns throughout the State. TNEB was restructured on 01.11.2010 into TNEB Limited; Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO); and Tamil Nadu Transmission Corporation Limited (TANTRANSCO).

1.1.0 Generation

1.1.1 Projects commissioned for last three years

Tamil Nadu Government accords top most priority to electricity sector thereby providing quality and reliable electricity to the people of the State.

Thanks to the tireless efforts of Honourable Chief Minister all time high peak demand of 13,775 MW was met by TANGEDCO on 24.06.14 and energy consumption of 293.97 MU was met on 20.06.14.

In the generation front, the sustained efforts taken by the Honourable Chief Minister have resulted in commissioning of the following thermal projects.

The first 2 units of capacity of 500 MW each of TNEB-NTPC Joint Venture project (3x500 MW) are generating power commercially from 29.11.12 and 25.08.13 respectively. The share for these two units are 700 MW.

The commercial power generation has started from 12.10.13 in Mettur Thermal Power Station Stage III (1x600 MW).

Unit 1 & 2 of 600 MW capacity each of North Chennai Thermal Power Station Stage-II have declared commercial operation from 20.03.14 and 08.05.14 respectively.

With the commissioning of these 5 units, additional power generation capacity of 2,500 MW has been created.

Apart from this, Bhavani Kattalai Barrage 2 & 3 with installed capacity of 30 MW each, Periyar–Vaigai small hydel with installed capacity of 2.5 MW and Bhavani Barrage II with installed capacity of 10 MW have been added to the grid. The capacity of first 3 units of Periyar power house have been uprated to 42 MW from 35 MW.

In addition to this, under Central sector, the first two units of Simhadri Stage II with installed capacity of 500 MW each have declared

commercial operation from 16.09.11 and 30.09.12 respectively. Tamil Nadu's share from this project is 199 MW.

Totally, 2,792.5 MW capacity of power has been added to the Tamil Nadu's grid for the last 3 years. Hence, the restriction & control measures in force have been withdrawn from 01.06.2014.

1.1.2 Present Status of Demand – Supply

The present demand of power in the state is around 13,000-13,500 MW. It is expected to go upto 14,500 MW by the end of 2014-15. This demand will be met by the generation from existing power stations, power from projects to be commissioned in the year 2014-15 and power purchase.

1.1.3 Installed capacity

The installed capacity of conventional energy sources of Tamil Nadu Generation and Distribution Corporation Limited is 11,884.44 MW as on 31.03.14 which includes

TANGEDCO's Hydro (2,284.4 MW), Thermal (4,060 MW), Gas Stations (515.88 MW), share from Central Generating Stations (3,870 MW), Private Power Projects (1,154.16 MW). This installed capacity has increased to 12,484.44 MW as on 01.06.14 after declaration of commercial operation of North Chennai Thermal Power Station Stage II unit 2.

The installed capacity of non-conventional energy sources as on 31.03.2014 (infirm power) is 8,219.67 MW which includes wind generation (7,252.61MW), Solar 96.66 MW, Biomass (211.00 MW) and Co-generation plants (659.40 MW). The Solar generation capacity increased to 107.20 MW as on 31.05.2014.

1.1.4 Projects to be commissioned in 2014-15

To meet the ever increasing demand, TANGEDCO is taking all efforts on war footing basis to commission the following projects.

Third unit of 500 MW capacity of TNEB-NTPC Joint Venture project has been synchronized on 28.02.2014 and is expected to be commissioned during August 2014. The share of Tamil Nadu from this unit is about 350 MW.

The units 1 and 2 of TNEB – NLC JV (2x500 MW) project at Tuticorin are expected to be commissioned in October 2014 and March 2015 respectively. The share of Tamil Nadu from both the units is 387 MW.

The unit 1 of Kudankulam Atomic Power Station has reached the power generating capacity of 1,000 MW on 07.06.14. Tamil Nadu's share from this unit is 462 MW. In addition 100 MW has been allocated by Government of India from the unallocated share due to the great efforts of our Honourable Chief Minister. The unit 2 of this project is expected to be commissioned by the end of this year. The share from this unit is 463 MW.

Neyveli Lignite Thermal Power Station II Expansion (2x250 MW) is expected to be commissioned during 2014-15. Tamil Nadu's share from this project is 230 MW.

Renovation, Modernization and Uprating works (RMU) have been completed in the first 3 units of Periyar power house. The works in unit 4 is under process and is expected to be completed by this year. The capacity of this unit will increase to 42 MW from 35 MW.

About 2000 MW of additional power generation capacity is expected to be added to the Tamil Nadu's grid in the current year of 2014-15.

1.1.5 Power purchase

Under medium term power purchase, 500 MW of power is being procured from June 2013. Power purchase agreements have been signed to procure 3,330 MW of power under long term for 15 years from 2014-15. Out of this, 224 MW of power is already being availed. 1,500 MW

of power would be flowing from August 2014. The balance will be available from 2015-16.

1.1.6 Future Projects

Considering the demand-supply projection in the coming years, TANGEDCO has initiated action to establish the following new projects. They are as follows:

1) Ennore Thermal Power Station Expansion (1x660 MW)

The project cost is Rs 5,000 crores. Acceptance letter for EPC contract has been issued to M/s. Lanco Infratech Ltd. on 27.02.2014. Letter of Intent to the above contractor has been issued on 30.05.2014. This project is expected to be commissioned in 2017.

2) Ennore SEZ Thermal Power Project (2x660 MW)

This project consists of 2 units of 660 MW capacity each with super critical thermal technology. The cost of the project is Rs. 8,391 crores. The tenders for construction of this

project are under evaluation and will be awarded shortly. This project is likely to be commissioned in 2018-19.

3) Udangudi Thermal Power Project (2x660 MW)

The cost of the project including the cost of coal jetty is Rs. 10,121 crores. Honourable Chief Minister of Tamil Nadu has ordered development of this Project by TANGEDCO itself. Tenders for this project are under evaluation and will be awarded shortly. This project is expected to be commissioned in 2018-19.

4) Uppur Thermal Power Project (2x800 MW)

The site for the project is located in Uppur village in Thiruvadanai taluk in Ramanathapuram District. The cost of the project is Rs.9,600 crores. This project is being developed with private sector participation through tariff based bidding. Public hearing for the captioned project has been conducted on 04.07.2014. This project is expected to be commissioned in 2019-20.

5) North Chennai Thermal Power Project Stage III (1x800 MW)

The cost of the project is Rs 4,800 crores. Various studies for obtaining environmental clearance for this project of 800 MW capacity have been completed. Arrangement is being made to conduct public hearing for the project. After the public hearing, environmental clearance will be obtained from the Ministry of Environment and Forests, Government of India. This project is expected to be commissioned by 2019-2020.

6) Ennore Thermal Power Station Replacement (1x660 MW)

The cost of the project is Rs 3,960 crores. Government of Tamil Nadu has proposed replacement of old 5 units of ETPS (450 MW) with a new single 660 MW super critical unit. Pre-feasibility report has been prepared and the project development activities are under progress. The project is likely to be commissioned by 2019-2020.

7) Udangudi Expansion Project (2x660 MW)

The project cost is Rs 7,920 crores. Pre-Feasibility report has been prepared. Project development activities are under progress.

8) Udangudi Power Project Stage III (2x660 MW)

As it is difficult to get the environmental clearance from Ministry of Environment and Forests / Government of India for the Tuticorin Thermal Power Station Replacement Project Stage IV (1x800 MW) in view of CRZ regulations and Gulf of Mannar biosphere related restrictions, it is proposed to establish 2x660 MW power project at Udangudi.

9) Cheyyur Ultra Mega Power Project of 4000 MW

The project cost is Rs 25,970 crores. Tamil Nadu will get 1,600 MW power from the project as its share. This being an ultra mega power project is being developed by Government of India with private sector participation through Power Finance Corporation. Environmental clearance has been received for the project. The plant is expected to be commissioned in the year 2019-20. The first part of bid i.e., Request for Qualification (RFQ) has been opened on 20.11.13. Five qualified bidders have purchased the Request for Proposal (RFP) documents which are scheduled to be opened on 22.09.14. Land acquisition for 1100 acres has been completed by the Government of Tamil Nadu.

10) Pithead power Plant in Chattisgarh (4000 MW)

A coal block in the State of Chattisgarh has been allocated jointly to Tamil Nadu Generation and Distribution Corporation Limited with Maharashtra State Mining Corporation for captive mining. The quantity of coal will be shared between Tamil Nadu and Maharashtra in the ratio 77:23. A joint venture company "MahaTamil Collieries Ltd" has been formed. A pithead power station utilizing Tamil Nadu Generation and Distribution Corporation Limited's share of coal is being developed. M/s. Lanco Infratech has been selected by competitive bidding as the Mine Developer and Operator (MDO). They have proposed to establish a 4,000 MW power plant near the pithead. The share of power from this plant for Tamil Nadu is upto 2,500 MW. Mine development activities are under progress.

11) Kundah pumped storage hydro-electric project (4x125 MW)/Nilgiris District

Access tunnel works are in progress. Construction of cable cum ventilation tunnel will also be taken up during this year. Approach road works are in progress.

12) Sillahala Pumped Storage HEP (2000 MW - 4x500 MW)

TANGEDCO has planned to develop the Sillahalla Pumped Storage HEP in Nilgris district in two phases.

Phase-I: Construction of Sillahalla dam and inter-connecting tunnel between Sillahalla and Emerald Reservoir for augmentation of power generation in the Kundah system.

Phase-II: Water conductor system taking off from Sillahalla Reservoir, underground power house with 4 units of 500MW each (2000 MW), Access Tunnel, Power Transmission and drawal system, etc.

Works relating to preparation of Detailed Project Report (DPR) are in progress.

1.1.7 Coal

Fuel Supply Agreements (FSA) have been executed with coal companies (MCL and ECL) for existing and new thermal power stations for a supply of 179.40 lakh tonnes of coal per annum for the year 2013-14. But the actual quantity of coal received during the year is only 125.69 lakh tonnes. As the supply of coal by Coal India Limited is much less than the contracted quantity, the balance requirement is met by import. The imported coal received for the year 2013-14 is 58.06 lakh tonnes.

1.1.8 Performance of existing thermal power stations

Eventhough the existing thermal power stations are more than 20 years old, they are performing well. The PLF achieved by TTPS, MTPS and NCTPS during 2013-14 are 85.8%, 88.04%

and 74.33% respectively against all India average of 65.55%.

1.1.9 Co-Generation projects

TANGEDCO has taken up establishment of 12 Co-generation Plants in Co-operative and Public Sector Sugar mills along with Sugar mill Modernization in Tamil Nadu at a total Cost of Rs 1,241.15 crores. The total Capacity of Co-generation Projects is 183 MW. These Projects are expected to be commissioned during 2014-15.

1.1.10 Solar power

To utilize the non-conventional energy sources to the maximum possible extent, Solar Energy Policy has been released by the Honourable Chief Minister of Tamil Nadu. To implement this effectively, as a first step, Roof-top Solar Power Plant of 60 KW installed at TANGEDCO Head Quarters was inaugurated by

the Hon'ble Chief Minister of Tamil Nadu on 30.12.2013.

Further, letters of intent has been issued by TANGEDCO to establish solar power plants of 708 MW capacity to fifty two private developers. Approval of rate and power purchase agreement from Honourable Tamil Nadu Electricity Regulatory Commission is awaited. Meanwhile, some consumer association has filed petition with Appellate Tribunal for Electricity (APTEL) against the Solar Purchase Obligation (SPO) fixed by TNERC. APTEL has set aside the TNERC order fixing Solar Purchase Obligation. TANGEDCO has filed an appeal petition in the Supreme Court against the APTEL order.

However, a capacity of 102 MW of solar power plants in other schemes has been installed after the Government assumed charge.

1.2.0 Transmission

TANTRANSCO has planned to develop the transmission infrastructure to effectively evacuate power from the existing and new power stations.

After this Government has assumed charge, 134 substations (up to 31.03.2014) have been commissioned to provide reliable power supply for the consumers. 51 substations at a cost of Rs 394.50 crores have been inaugurated by our Honourable Chief Minister on 12.06.14.

1.2.1 Transmission schemes for wind power evacuation

1.2.1.1 Phase-I Transmission system

A main backbone network consisting of 2 new 400 kV substations and 1,488 circuit kms of 400 kV Lines has been taken up at an estimated cost of Rs 2,262.75 crores. The network will connect Kayathar (New SS) – Karaikudi (existing PGCIL SS) – Pugalur (existing PGCIL SS) – Kalivanthapattu - Sholinganallur (New SS - Ottiyambakkam) for effectively transmitting the

power across the State. Kayathar substation and the entire line works from Kayathar to Kalivanthapattu near Chennai will be commissioned by September 2014. Sholinganallur (Ottiambakkam) 400 kV SS works and Kalivanthapattu to Ottiambakkam line works are under progress and will be completed by 2015-16.

1.2.1.2 Phase-II Transmission System

A separate corridor with the 400kV substations at Thappagundu (New SS), Anikadavu (New SS) and Rasipalayam (New SS) along with the associated 400 kV lines of 798 kms connecting to the 765 kV substation being executed by PGCIL at Salem has been taken up at an estimated cost of Rs 1,190.18 crores. Tenders have been awarded and works are under progress. This transmission system is expected to be commissioned during 2015-16.

1.2.2 Inter State Power Evacuation

For effective utilization of inter-state power, establishment of 400 kV substation at Tiruvalam along with associated transmission lines from Tiruvalam to Mettur Thermal Power Station - Stage-III and 400 kV substation at Alamathy with a 696 circuit kms of associated transmission line at an estimated cost of Rs 993.43 crores is under progress and are expected to be completed by August 2014.

1.2.3 JICA Assistance

Under the Official Development Assistance (ODA) Loan of JICA, funding assistance amounting Rs 3,572.93 crores for establishing 5 nos. 400kV substations and 14 Nos. 230 kV substations and associated transmission lines in five years have been sanctioned. Out of the five 400 kV substations, works are under progress at Sholinganallur substation. Tender has been finalized and work is being awarded for Karamadai substation. Tenders are under process

for Manali substation and tenders are to be called for in respect of Korattur and Guindy substations. Out of fourteen 230 kV substations, works are under progress in respect of Alandur and Ambattur 3rd Main Road. Tender has been finalised and work is being awarded for Kinnimangalam, Raja Annamalaipuram, Kumbakonam, Poiyur, Karuvallur and Central substations. Tenders are under scrutiny in respect of Purisai and TNEB Head Quarters substations. Retenders have been floated for Kanchipuram, Savasapuram, Shenbagapudhur and Tiruppur substations.

1.2.4 Additional Transmission Schemes for evacuation of Renewable Energy

It is proposed to take up transmission schemes for augmenting network for evacuation of wind power and solar power at a total cost of Rs 1,600 crores approximately with financial assistance of Rs.637.2 crores (40%) from National Clean Energy Fund as grant, 40% from

German Financial Institution KfW as soft loan and the remaining 20% from TANTRANSCO's own funds as equity.

1.3.0 Distribution

During the year 2013-14, 28 nos. 33 kV substations have been erected, 10,007 kms of LT lines and 4,089 kms of HT lines have been energized. TANGEDCO had also effected service connections to 10.04 lakhs new consumers.

After this Government has assumed charge 29.81 Lakh connections have been given upto 31.03.2014.

To strengthen the distribution network further, it is programmed to lay 15,000 kms of High Tension and Low Tension lines during 2014-15.

Moreover, it is proposed to enhance capacity of 120 numbers of power transformers in the substations.

Categorywise total number of consumers being served in the State as on 31.03.14 is as follows:

Sl.No.	Category	Number
1.	Domestic	1,72,19,933
2.	Commercial	32,87,073
3.	Industries	5,98,750
4.	Agriculture	20,47,174
5.	Huts	11,82,835
6.	Others	8,95,771
	Total	**252,31,536**

1.3.1 Strengthening of Distribution network

TANGEDCO has initiated various measures to strengthen the distribution infrastructure.

1.3.1.1 Re-conductoring

TANGEDCO has planned to replace the existing aged HT/LT lines at an estimated cost of Rs 1,054.22 crores in a phased manner.

1.3.1.2 Conversion of overhead lines into underground cables

TANGEDCO has proposed to convert HT and LT overhead lines into HT and LT underground cables in cyclone prone coastal towns of Cuddalore and Nagapattinam. To implement this scheme, soft loan to the tune of Rs 360 crores has been sanctioned from the World Bank.

1.3.1.3 Rural Electrification

Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) with the goal of creating electricity infrastructure to all un-electrified villages / un-electrified hamlets provide access to electricity to all households.

Implementation of RGGVY in 26 districts of Tamil Nadu had already been completed. Further, implementation of the RGGVY scheme in Nilgiris, Tirunelveli and Dharmapuri districts for a total cost of Rs 37.27 crores is under progress.

Hundred percent electrification has been completed in Tamil Nadu as per the guidelines prescribed by the Central Government. However, 113 habitations in remote forest areas are yet to be provided with electricity supply. Action is being taken for electrification of this unelectrified habitations situated in the forest and hilly areas through solar power.

1.3.1.4 Strengthening through R-APDRP

The objectives of the R-APDRP Scheme are to provide quality and reliable power supply to the consumers and to bring down the Aggregate Technical and Commercial losses (AT&C) below 15%. The project is taken up in two parts.

Part-A:

Rs.417 crores towards IT implementation activities in 110 towns and Rs.182.17 crores for Supervisory Control and Data Acquisition/Distribution Management Systems (SCADA / DMS) activities in 7 towns has been sanctioned. Twelve towns have been made "Go-Live" and the IT implementation activities for balance towns are expected to be completed by June 2015. SCADA / DMS activities are expected to be completed by June 2015.

PART-B:

An amount of Rs.3,279.56 crores has been sanctioned for 87 towns for distribution strengthening and improvement works. Distribution strengthening works are in various stages. Further an amount of Rs 90.81 crores have been sanctioned for an additional 10 towns.

1.3.2 Energy conservation measures

a. Theft of Energy

TANGEDCO has formed 40 teams of Ex-servicemen, 17 enforcement squads and one flying squad for inspection and detection of theft of energy in Electricity Distribution Circles. During the year 2013-14, Ex-servicemen teams have detected 14,807 Nos. of power theft cases and have levied Rs 23.61 crores towards provisional assessment and compounding charges. Similarly enforcement squads have detected 3,186 cases of theft of energy and have levied Rs 22.36 crores towards provisional assessment and compounding charges. Intelligence wing has also been formed to study and analyze electronic data from the meters for the HT consumers and detect theft of energy cases in HT consumers. The Intelligence wing has detected 30 cases and levied penalties for Rs 59.51 lakhs.

b. Distribution of Compact Fluorescent Lamps (CFLs)

Various energy conservation measures are being promoted. Especially, 9 watts Compact Fluorescent Lamps (CFL) have been distributed to all hut consumers availing free electricity to replace incandescent lights free of cost.

c. Energy saving PAT Scheme for power stations

Under the Perform, Achieve and Trade (PAT) scheme, mandatory energy reduction targets have been prescribed for thermal power stations. The improvement works for reduction of energy consumption at a cost of Rs 20.90 crores in North Chennai Thermal Power Station (NCTPS), at a cost of Rs 45.55 crores in Tuticorin Thermal Power Station (TTPS) and at a cost of Rs 67.88 crores in Mettur Thermal Power Station (MTPS) are being undertaken.

1.3.3 Consumer Satisfaction Measures

TANGEDCO is taking all efforts to simplify payment of electricity bills. The collection systems are already computerized. Consumer services have been improved by extending payment facility through internet. So far agreements had been entered with 18 Banks and online collection of current consumption (CC) charges from LT consumers commenced.

There is also facility for accepting the current consumption charges from consumers by post offices. In addition to the coverage of 1,978 post offices already existing, 544 post offices have been recently added.

TANGEDCO is providing the facility of LT CC charges collection through Urban Common Service Centres in Chennai city from 02.05.2014. About 35 lakh LT consumers are availing alternative modes of payment.

In addition to this, Honourable Chief Minister has launched the scheme of sending messages through SMS regarding current consumption charges and due date of payment for the consumers on 12.06.14. The HT Consumers are also provided with the facility of making their electricity monthly bills through NEFT/RTGS mode. About 2,000 HT consumers are using this mode.

1.3.4 Call centers

Computer based grievance redressal call centres are functioning at Chennai, Coimbatore, Madurai, Trichy, Erode, Tirunelveli, Nagercoil, Salem, Vellore, Karur and Tiruppur. Consumers can register their power supply failure complaints by dialing 1912 from 14.03.14. These centres are also being strengthened to improve the performance level.

1.4.0 Finance

As per the Financial Restructuring Plan approved by Government of Tamil Nadu, 50% of the short term liabilities of TANGEDCO are to be taken over by the State Government. Towards this, Bonds to the extent of Rs 6,353.49 crores have been issued to the commercial banks. The repayment of principal and interest of Bonds is being borne by Government of Tamil Nadu. The interest to the tune of Rs 578 crores per annum is being released by Government of Tamil Nadu directly to the commercial banks.

The tariff subsidy of Rs 4,917.99 crores relating to the financial year 2013-14 has been released by Government of Tamil Nadu. The Government of Tamil Nadu has also provided Equity Share Capital assistance of Rs 2,153 crores during 2013-14. The Government of Tamil Nadu has also released loan assistance of Rs 962 crores under Financial Restructuring Plan. Further, the Government of Tamil Nadu has

provided Government Guarantee to an extent of Rs 12,185 crores for mobilizing funds during 2013-14.

For the current financial year 2014-15, the Government of Tamil Nadu has provided the following financial assistance of Rs 10,575 crores in the Budget Estimate 2014-15.

Sl.No.	**Financial assistance**	**Amount (Rs. in crores)**
1	Equity Share Capital Assistance	2,050
2	Tariff Subsidy	5,400
3	Loans under FRP	1,000
4	Taking over of Bonds of TANGEDCO	2,000
5	Hydel Swing Subsidy	125

1.5.0 Recruitment

To provide better service to the consumers, 275 Assistant Engineers, 1,000 Technical Assistants, 1,000 Assessors and 4,000 Helper Trainees have been recruited during the year 2013-14.

TAMIL NADU ENERGY DEVELOPMENT AGENCY

Tamil Nadu Energy Development Agency was formed in 1985 for promoting use of Renewable energy in the State. It is also the State nodal agency for channelizing central financial assistance from Ministry of New and Renewable Energy. The agency is also involved in Renewable Energy support activities. It also facilitates various Government departments in implementing renewable energy schemes through product identification and bid process management.

With a total renewable energy installed capacity of 8,219.67 MW Tamil Nadu is an undisputed leader in use of renewable energy in India. This accounts for 25.11% of the total installed renewable energy capacity of 32,730 MW in the Country. The installed capacity of Renewable energy is 39 % of the total installed capacity in the State. The contribution of

renewable energy to the State energy is 13.43%. This is higher than the contribution of renewable energy in the country which is 10.03%.

Installed Capacity of Renewable Energy

Sl. No.	Renewable Energy Type	Installed Capacity (MW) (as on 31.03.2014)
1.	Wind	7,252.61
2.	Bagasse cogeneration	659.40
3.	Bio Mass Power	211.00
4.	Solar	96.66
	TOTAL	8,219.67

Wind constitutes the highest component of the renewable energy in Tamil Nadu. The installed capacity of the wind mills in the State is highest in India. The state is second in the country in terms of installed capacity of Cogeneration based power plants.

2.0 Tamil Nadu Solar Energy Policy 2012

The objective of the policy is to encourage Public participation in promotion and use of solar energy. The Hon'ble Chief Minister's vision is to make use of Solar energy a people's movement as was done earlier in the case of Rain Water Harvesting. This is proposed to be achieved by encouraging grid tied solar roof top systems at government and private buildings. Large capacity addition is proposed through solar power generation by use of Power purchase agreements and Renewable energy certificate mechanism. For the first time in India, Net metering has been permitted in the State, both for domestic and commercial consumers. Net metering means that consumers are charged net of energy drawn from grid and solar energy fed to the grid.

2.1 Chief Minister's Solar Powered Green Houses Scheme

This is India's largest scheme for installation of Solar Roof top panels for self

consumption. Under the scheme every year 60,000 green houses are constructed with solar panels on the roof top to meet the energy needs of the households. The solar panel is used to power a set of five lights in the house.

2.2 Solar Powered Street Lights

The Solar Street lights Scheme for the rural areas launched in 2011-12 envisages conversion of 1,00,000 streetlights to solar powered energy efficient street lights. Under the scheme every year 20,000 existing street-lights fittings are being replaced with energy efficient 20 watt LED lamps. The lights are energized through solar power resulting in considerable saving in electricity charges for the local bodies.

2.3 Installation of SPV power plants in BC/MBC/DNC Hostels

Government had sanctioned for the installation of 1 kwp solar power plants at 103 BC/MBC/DNC and minorities college hostels. So far work of installation of Solar Panels and

replacement of existing lights and fans with energy efficient fans and tube lights has been completed in 69 hostels. The installation of solar panels in balance 34 hostels is likely to be completed soon.

2.4 Chief Minister's Solar Roof Top Capital incentive Scheme for domestic consumers

Under the Chief Minister's Solar Rooftop Capital Incentive scheme, an incentive of Rs 20,000/- is being provided towards installation of Grid tied Battery-less Solar Photo Voltaic Rooftop plants of 1 KW capacity for domestic consumers. The generated solar power can be consumed within the house or fed into the Grid through net metering arrangement. This incentive is in addition to the 30 % subsidy for such solar plant in other schemes. The scheme envisages public participation with government support and is poised for steady growth in capacity addition, in addition to awareness creation.

2.5 Financial Assistance available for Renewable Energy schemes

Subsidy is available for the following schemes for encouraging solar photo voltaic generation:-

Sl. No.	Name of the Scheme	Available Financial Assistance/ Subsidy (per KWp)
1.	Solar Water Pumping System Up to 5kWp	Rs 57,000
2.	SPV Power Plants (with battery bank having 6 hours autonomy) >300 Wp to 1Kwp >1 KWp to 10 KWp >10 KWp to 100 KWp	 Rs 63,000 Rs 57,000 Rs 51,000
3.	SPV Power Plants (Without Battery) Up to 100 KWp >100kWp to 500kWp	 Rs.30,000 Rs 27,000

4.	Micro Grid (DC) Up to 10 KWp	Rs 1,05,000
5.	Mini Grid >10 to 250 KWp	Rs 90,000
6.	Street Lights through SPV power Plant Up to 100 KWp	Rs 90,000

a) Off-Grid Solar Thermal Application

Financial assistance is available for various off-grid solar thermal applications for converting solar energy to heat energy. This is widely used in commercial and industrial drying applications.

Financial assistance of Rs 8.16 crore has been sanctioned in last three years for schemes under the following categories.

Sl. No.	Name of the Scheme	Available Financial Assistance / Subsidy (per sq.m.)
1.	(a)Flat Plate Collectors (FPC) Domestic - Non-Domestic -	 Rs 3,300 Rs 3,000
	(b)Evacuated tube collectors Domestic - Non-Domestic -	 Rs 2,550 Rs 2,400
2.	Flat Plate Collectors with air as the working medium	Rs 2,400
3.	Solar collector system for direct heating applications	Rs 3,600
4.	Concentrator with manual tracking	Rs 2,100
5.	Non- imaging concentrators	Rs 3,600
6.	Concentrator with single axis tracking	Rs 5,400
7.	Concentrator with double axis tracking	Rs 6,000

b) Bio-mass based projects

Financial assistance is also available for electricity generation through solid biomass such as wood, wood waste, agricultural residue.

Sl. No.	Name of the Scheme	Available Financial Assistance/ Subsidy
1.	Bio-mass based power projects	Rs 20 lakh X (CMW) Maximum support Rs 1.5 Crore/Project
2.	Bagasse Co-generation In Private sugar mills	Rs 15 lakh X (CMW) Maximum support Rs 1.5 Crore/Project
3.	Bagasse Co-generation projects by cooperative/ public sector sugar mills (maximum support Rs. 6.0 crore per project)	Boiler Pressure of 40 bar & above - Rs 40 lakhs/MW of surplus power
		Boiler Pressure of 60 bar & above - Rs 50 lakhs/MW of surplus power
		Boiler Pressure of 80 bar & above - Rs 60 lakhs/MW of surplus power

4.	Distributed/off grid power projects in rural areas and grid connected power projects with 100% producer gas engines or biomass based combustion projects.	Rs 15,000 per KW
5.	Biomass gasifier projects for Distributed/Off-grid for Rural Areas and grid connected power projects for ensuring regular availability of biomass, provision of collection, processing and storage and operation &maintenance including compulsory AMC for 5 years after the guarantee period.	Rs 1.5 lakh per 50 KW

6.	Biogas based Power Generation systems under Biogas power (Off-Grid)	For 3-20 kW (25 m^3 to 85 m^3 Plant Capacity) – Rs 40,000 per kW
		>20kW up to 100kW (Any combination of above plants or approved alternate capacity/Design) Rs 35,000 per KW
		>100kW up to 250 KW (Any combination of above plants or approved alternate capacity/Design) – Rs 30,000 per Kw
7.	Power generation from municipal solid waste	Rs 2.0 crore/MW (Maximum Rs.10 crore/project)
8.	Power generation from biogas at sewage treatment plant or through biomethanation of urban and agricultural waste/ residues	Rs 2.0 crore/MW (Maximum Rs 5 crore/project)
9.	Biogas generation from urban, Industrial and agricultural wastes/residues	Rs 0.5 crore/MW (Maximum Rs 5 crore/project)

10.	Power generation from biogas (Engine/ Gas turbine route)and production of bio-CNG for filling into gas cylinders	Rs 1.0 crore/MW (Maximum Rs 5 crore/project)
11.	Power generation from biogas from solid industrial, agricultural wastes/residues excluding bagasse through boiler+ steam turbine configuration	Rs 0.2 crore/MW (Maximum Rs 1 crore/project)

c) Small wind energy and Hybrid systems

Financial assistance is available for the following schemes.

Sl. No.	Name of the Scheme	Available Financial Assistance/ Subsidy
1.	Small Wind Energy & Hybrid Systems	Rs 1,00,000/- per KW

2.	Development / Up-gradation of Watermills	1. Mechanical output only - Rs 35,000/- per Watermill 2. Electrical output only (up to 5 kW) – Rs 1,10,000/- per Watermill 3. Both Mechanical and Electrical output (up to 5 kW) – Rs 1,10,000/- per Watermill
3.	Micro Hydel Projects (up to 100 kW capacity).	Rs 40,000/- per KW

Water mills numbering 77 with a financial assistance value of Rs 0.85 Crore has been sanctioned and work completed in the last three years.

d) Battery Operated Vehicles

Encouraging the usage of alternate fuels especially for surface transport is one of the simplest way of saving oil and environment

protection. Financial assistance of Rs 1.24 Crore was provided for 3,635 battery operated vehicles for promoting alternate energy concept.

2.6 International Renewable Energy Conference (RENERGY)

The Tamil Nadu Energy Development Agency (TEDA) conducted Renergy 2014, an International Conference and Exhibition on Renewable Energy at the Chennai Trade Centre from 12th-14th June, 2014. It attracted 119 exhibitors, 15,000 visitors and 1,500 conference delegates. Workshops, Expert and networking sessions, International clean tech collaboration meet and Research and Innovation sessions were conducted which created a knowledge sharing platform for the delegates.

2.7 Information Technology and Capacity Building

Implementation of Renewable Energy schemes in each district is monitored by TEDA's district offices. On line data base management is

being done for tracking of Solar Photo Voltaic (SPV) systems and Solar Water Heating Systems. All the schemes are fully monitored through web based Enterprise Resource Planning (ERP) software. A call centre is functioning with toll free number 18001021224 for attending to the complaints of beneficiaries of Solar Powered Green Houses and monitoring of rectification by the installers and also to update the sanctioning process to the beneficiaries of the Chief Minister's Roof Top Grid Tied Solar Capital Incentive Scheme. In addition, the same Toll Free number is being used for attending to the complaints received in respect of the solar street lighting system installed in various village panchayats all over the State.

ELECTRICAL INSPECTORATE DEPARTMENT

The Electrical Inspectorate department is responsible for ensuring compliance of the safety provisions in electrical installations as per the Electricity Act, 2003. The department was created on 7th September 1961 and has also been entrusted with licensing of Lifts, testing of electrical instruments, levying and collection of Electricity Tax and promoting energy conservation.

3.0 Services Rendered by the Electrical Inspectorate Department

The following services are rendered by this department at the State, Regional and District level offices:

i. Inspection and approval after the completion of projects in High Voltage, Extra High Voltage electrical installations and Multistoried buildings as per Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010.

ii. Calibration & Testing of electrical equipments and meters.

iii. Co-ordinating, regulating and enforcing the provisions of the Energy Conservation Act, 2001 (Central Act 52/2001) as State nodal agency for energy conservation.

iv. Monitoring and collection of tax on consumption or sale of electrical energy under the Tamil Nadu Tax on Consumption or Sale of Electricity Act, 2003.

v. Licensing for erection and maintenance of the lifts under the provisions of Tamil Nadu Lifts Act, 1997.

vi. Certification of electrical safety to cinema buildings for enabling issue of license by the District Collector as per Tamil Nadu Cinema (Regulation) Rules, 1957.

vii. Licensing and Certification for Electrical Contractors and qualified electrical personnel through the Tamil Nadu Electrical Licensing Board.

3.1 Performance & Revenue receipts

This department has issued licenses for erection of 2114 new lifts during 2013-14. The licenses for 8531 existing lifts were renewed during the year 2013-14. The department gave permission for energisation of 354 new electrical installations. Statutory inspections of 4004 High Tension installations were carried out during the year 2013-14. Apart from this 533 Cinema theatres were inspected and the plans for new 1963 installations were scrutinized for compliance with the provisions of the Electricity Act. 4263 testing and calibrations were also done during the year. The department mobilized Rs 12.28 crores of revenue from its inspection and other services. The department is also responsible for levying and collection of electricity tax under Tamil Nadu Tax on Consumption or Sale of Electricity Act, 2003. It collected Rs 103.08 crores of electrical tax from various generators supplying electricity

to consumers other than Tamil Nadu Generation and Distribution Corporation Limited.

3.2 Testing and Calibration

Government Electrical Standards Laboratory is part of the Electrical inspectorate. The laboratory calibrates energy meters and other electrical instruments for various State Electricity Boards in our country using modernized energy meter test bench with 100 ppm accuracy. This laboratory has been accredited by National Accreditation Board for Testing and Calibration Laboratories for calibrating within 270 ppm accuracy from October, 2013. This facility thus is able to offer services as per the International Standards. It is one of the few laboratories in the Country to have facilities for calibration up to 150 ppm accuracy.

3.3 Energy Conservation

(i) State Energy Conservation Fund

State Energy Conservation Fund has been constituted for promotion of efficient use of energy and its conservation, under Section 16 of the Energy Conservation Act, 2001. The fund is utilized to formulate and implement pilot/demonstration projects for the promotion of efficient use of energy and its conservation and capacity building activities. Available funds were utilized for pilot projects of improving energy efficiency of electrical motors in lime kiln in Tirunulveli, Energy audit of government buildings and activities for awareness creation and capacity building among students, industrial engineers and general public.

(ii) Energy Conservation Building Code (ECBC)

The Energy Conservation Building Code (ECBC), is a model document prepared by

Ministry of Power, Government of India, listing out mandatory requirement of energy efficiency in the Building sector. The ECBC prescribes minimum energy efficiency standards for design and construction of commercial buildings. The Energy Conservation Act, 2001, clause 15(a), empowers State Government to amend the energy conservation building code. Accordingly, Government of Tamil Nadu has constituted a technical committee for evolving technical guidelines for adoption of ECBC by the planning authorities. The committee has proposed changes in ECBC to suit local climate conditions and promotion of efficient lighting systems.

(iii) Perform, Achieve and Trade Scheme

As per the Energy Conservation Act, the Central Government has notified energy conservation targets for energy intensive industries known as designated consumers. The Perform, Achieve and Trade scheme is a market

based mechanism to encourage energy conservation among designated consumers. Under this scheme, energy saving certificates are issued to the designated consumers who over-perform the energy saving targets. The under achieving designated consumers either have to purchase the energy saving certificates or to pay penalty. The targets and possible energy saving in the State are as follows:

Name of the sector	Number of consumers	Energy Saving target in Tonnes of Oil Equivalent (TOE)	Avoided power plant capacity in MW through savings
Chlor-Alkali	3	4,066	7
Textile	5	918	2
Pulp & Paper	3	9,952	17
Fertilizer	1	5,130	9
Thermal Power Plant	20	3,14,361	535
Cement	9	60,938	104
Total	41	3,95,365	674

The specific energy consumption compliance is targeted to be achieved before March 2015. On completion of the Scheme, saving equivalent to 675 MW of power plant capacity will be achieved.

(iv) Waste Heat Recovery Policy for the State and Sector Specific Energy Savings Plan for the State

The Bureau of Energy Efficiency (BEE), under the Ministry of Power, Government of India supports activities related to the Energy Conservation and waste heat recovery projects. Accordingly, Electrical Inspectorate has appointed consultant to prepare the waste heat recovery policy and sector specific energy savings plan for the State. Survey of industries to assess the energy saving is under progress. Further, one demonstration project on waste heat recovery will be taken for implementation to show case the energy savings potential.

(v) Implementation of Energy Conservation Measures at NKM building, Tamil Nadu Secretariat and Ezhilagam Main Building, Chepauk

Based on an energy audit conducted at the NKM Building, Secretariat and Ezhilagam Main Building, Chepauk, the Electrical Inspectorate has taken up the demonstration project for achieving energy savings through simple measures such as replacement of lights, pumps, fans by energy efficient ones. The works are under progress. The energy saving after the completion of the project is estimated as per the following table:

Sl. No.	Name of the building	Energy Savings to be achieved (units/year)
1	NKM Building Tamil Nadu Secretariat, Chennai	3,45,000
2	Ezhilagam Main Building	2,42,000

3.4 Electrical Licensing Board

The Licensing Board was created in the year 1955 under the Electrical Inspectorate. As per regulation 29 of Central Electricity Authority, all the works of electrical installation can only be carried out by the licensed contractors and workmen. The board has been designated as competent authority to issue licenses to the electrical contractors and also to grant certificate of competency to wiremen and supervisors. The electrical contractor's license are classified as ESA, EA, ESB and EB grade depending upon the competency in handling High voltage. So far 6,506 contractors have been issued various types of license and 73,419 work men have been issued with competency certificates.

3.5 Reorganisation of Electrical Inspectorate

One of the important activity of Electrical Inspectorate is enforcement of rules and regulations framed under the Electricity Act, 2003, for safe utilization of energy. This

requires periodic inspections of HT installations. The number of HT installation in the State have now increased substantially over last few years. There was a steep increase in new installations in Kanchipuram, Tiruvallur, Tiruppur and Coimbatore. This growth caused uneven distribution of work load. Hence orders for re-allocation of offices commensurate with work load has been carried out. One new division at Chengalpattu in Kancheepuram district and one new division at Palladam in Tiruppur district has been created. Offices have been relocated in Ambattur, Ponneri, Sriperumpudur, and Tambaram where maximum number of HT installations are available. The jurisdiction of other offices have been defined correctly aligning with Taluk and district boundaries. These measures will improve accessibility and convenience of the consumers in availing services and improve operational efficiency of the department.

TAMIL NADU POWER FINANCE AND INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

The Tamil Nadu Power Finance and Infrastructure Development Corporation Limited (TNPFIDC) was incorporated on 27.06.1991 as a Non Banking Finance Company. The Company mobilizes funds for lending to the Power sector in Tamil Nadu particularly for schemes relating to Generation, Transmission and Distribution infrastructure of TANGEDCO and TANTRANSCO. TNPFIDC is classified as a Public Financial Institution by the Ministry of Company Affairs, Government of India. The authorized and paid up share capital of the Company is Rs.90 crores.

4.0 Fixed Deposits

TNPFIDC mobilize funds from individual as well as institutional investors. There is a steady increase in depositor base of the Company. This is perhaps the result of confidence of depositors reinforced by consistent profitability of the company. During the year (from 01.04.2013 to 31.03.2014), the Company mobilized a sum of Rs 1,538 Crores as net cumulative deposits. The net deposits during the year grew at a 18.73%. It increased from Rs 8,212 crores at the beginning of the year to Rs 9,750 crores as on 31.03.2014. This includes deposits mobilized from public, institutional deposits and the State Government schemes. Out of the total deposits of Rs 9,750 crores the contribution from the individual investors is Rs 2,288 crores and that of from institutional and State Government is Rs 7,462 crores.

4.1 Deposits of the State Government schemes

The funds for many government schemes are invested in TNPFIDC. Under Cash Incentive scheme, to avoid school dropout the School Education department deposited a sum of Rs 313.10 crores, Rs 353.56 crores and Rs 381.00 crores in the year 2011-12, 2012-13 and 2013-14 respectively. Under this scheme, school going students in government and government aided schools get an incentive of Rs 1,500/- per student per year for completing class 10^{th} and 11^{th} and Rs.2,000 for appearing in class 12 examination. The money is deposited with TNPFIDC and after appearing in class 12^{th} examination, the incentive along with interest is transferred to the bank accounts of the students. In last three years cash incentives have been paid to 8,58,702 students.

Under "Oru Kala Pooja" scheme Rs.1,00,000 is deposited for a temple. The

interest accrued is paid to the temple for performing daily one time pooja in the temple. The Hindu Religious and Charitable Endowments

Department has deposited Rs.110.34 crores for 11,413 temples under the Scheme.

Rs 781.99 crores has been deposited by Social Welfare department till 31.03.2014 under Girl child protection Scheme.

Rs 22.70 crores have been deposited by School Education Department under another of their scheme of assistance to students whose bread winning parents die or get permanently incapacitated in an accident.

4.2 Rate of Interest

TNPFIDC offers interest rate of 9.25% for deposits for one year, 9.50% for deposits for 2 years and 10% for deposits with tenure from 3 to 5 years. The Company offers an additional interest of 0.25% p.a. for 12 months & 24 months and 0.50% p.a. for 36, 48 & 60 months

on deposits made by senior citizens aged 58 years and above.

4.3 Financial Assistance to TANGEDCO

TNPFIDC lends only to TANGEDCO and TANTRANSCO for financing their infrastructure projects. From the inception till the year 31.03.2014, total sum of Rs 30,682.39 crores has been sanctioned as gross financial assistance to TANGEDCO by way of hire purchase, lease and term loan. During the year 2013-14, Rs 6,275.74 crores has been provided as financial assistance to TANGEDCO.

4.4 Acquisition of NLC Shares

Government accorded sanction for 5 Public Sector Undertakings to purchase a total of 3.56% of NLC (Neyveli Lignite Corporation) equity. TNPFIDC has acquired a total number of 59,70,126 equity shares of NLC at a cost of Rs 35,82,07,560. In this regard, Government have also accorded sanction for financial assistance of

Rs 37.50 crores as ways and means advance initially to enable TNPFIDC for the investment in shares in NLC. This advance has to be adjusted later as share capital.

4.5 Financial Performance

TNPFIDC has unique distinction of having a profit making company since inception. The total revenue of the company during the year 2013-2014 up to 31.03.2014 is Rs 1,320.39 crores. The net worth of the Corporation has increased to Rs 634.36 crores compared to that of Rs 531.72 crores at the end of the previous year. The corporation has so far accumulated a net profit of Rs 673.86 Crores. The provisional gross profit and Profit after tax for the year 2013-14 are Rs 151.36 crores and Rs 108.49 crores respectively. The Company had declared dividend regularly from the year 1995-96 and the total of Rs 81.42 crores has been paid as dividend to the Government.

Conclusion

The Vision Document 2023 launched by Hon'ble Chief Minister envisages fast track infrastructure development in the state. The phase-2 of the vision document 2023 profiles the specific projects and programme for implementation to achieve the targeted investments.

In this policy document the department has elaborated strategies and programme for implementation of the identified projects. It is endeavour of the department to commence the process of implementation of these projects by carrying out feasibility studies, acquiring lands and preparing Detail project reports. The implementation of the identified project is being fast tracked. At the same time policy intervention for achieving the identified sectoral goals in vision document have also been initiated. The Government of Tamil Nadu accords highest priority to increase power generation capacity in

the State. In last three years additional 2,792.5 MW of generation capacity has been added. The state has also signed long term power purchase agreement for procuring 3,300 MW of power from case-1 bidding. Apart from investment in generation close attention is being paid for modernizing and strengthening the electricity grid by improving distribution and transmission networks.

The department is also pro actively working towards encouraging investments for achieving a balance between consistent power availability and maintaining a high share of generation from clean energy sources. Through earnest and consistent policy initiative it is our endeavour to retain the preeminent position of leader in renewable energy in the country.

While a turnaround in power situation has been achieved in last three years department is conscious of challenges ahead. Accessibility, Adequate Availability and Affordability of power

for all is our goal and under the dynamic leadership of Honourable Chief Minister strive towards meeting the legitimate expectation of people for higher quality of life.

Natham R.VISWANATHAN
Minister for Electricity,
Prohibition and Excise