ENERGY DEPARTMENT

POLICY NOTE

2016-2017

DEMAND NO.14

Thiru. P.THANGAMANI
Minister for Electricity, Prohibition and Excise

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Introduction

Energy is one of the most critical inputs for economic development. The country faces a formidable challenge in meeting its energy needs and providing adequate energy of desired quality in various forms to users in a sustainable manner at reasonable costs.

The broad vision behind the energy policy of Tamil Nadu is to reliably meet the demand for energy services of all sectors including the life line energy needs of vulnerable households all over the state with safe and convenient energy at least cost in a technically efficient, economically viable and environmentally sustainable manner.

The Vision 2023 document released by the Hon'ble Chief Minister envisages a massive investment in the energy sector in the state.

During the last five years the Government of Tamil Nadu under the able leadership of Hon'ble Chief Minister of Tamil Nadu has followed a detailed road map and scripted a remarkable turnaround story. From being power deficit in 2011, the State has been transformed not only into a power sufficient State but also a power surplus State.

The Government under the leadership of Hon'ble Chief Minister of Tamil Nadu has adroitly managed the power situation by early commissioning of new projects and procurement of power through medium and long term power purchase agreements. Due to vigorous efforts of the Government, thermal power stations such as Mettur Thermal Power Station-II, North Chennai Thermal Power Station-II, TANGEDCO-NTPC Joint Venture Thermal Power Station at Vallur and TANGEDCO-NLC Joint Venture at Tuticorin have been commissioned and are generating power to the grid continuously. In the last 5 years

additional power of 8432.5 MW has been added to the grid by commissioning of new power stations in State and Central sector, through medium and long term power purchase agreements and Solar power.

The 40% Demand & Energy cut for High Tension Industrial & Commercial services imposed during normal hours i.e. other than evening peak hours (06.00 P.M. to 10.00 P.M.) and the 90% Demand & Energy cut imposed during evening peak hours (06.00 P.M. to 10.00 P.M.) with load shedding which was imposed during the year 2008 was gradually reduced to 20% in the year 2011 and all Restriction and Control measures have been completely withdrawn from 05.06.2015 and 24x7 power is being currently supplied to all categories of consumers.

Daily average power supply which was 200 million units (MUs) in 2010 has increased to 300 MUs in 2016. Also, Tamil Nadu has met an all time high peak demand of 15,343 MW and an all time high energy consumption of 345.617 MUs on

29.04.2016. Further, the Central Electricity Authority (CEA) in its Load Generation Balance Report (LGBR) had also categorically stated that Tamil Nadu will be a power surplus State in 2016-17 with a surplus of 11,649 MUs.

The following organizations are under the Administrative Control of Energy Department:

I. Erstwhile Tamil Nadu Electricity Board which has been re-organised 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. Electrical Inspectorate to Government

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 restructured on 01.11.2010 into TNEB Limited, Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) and Tamil Nadu Transmission Corporation Limited (TANTRANSCO).

Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) is responsible for power generation and distribution. Tamil Nadu Transmission Corporation Limited (TANTRANSCO) is responsible for transmitting power. The electricity network has been extended to all villages and towns throughout the State and the State is 100% electrified.

1.1 Turnaround in the last five years

Tamil Nadu has added 8432.5 MW to the State grid during the last five years, making Tamil Nadu not only a power sufficient State but also a power surplus State. The 40% Demand & Energy cut for High Tension Industrial & Commercial services imposed during normal hours i.e. other than evening peak hours (06.00 P.M. to 10.00 P.M.) and the 90% Demand & Energy cut for High Tension Industrial & Commercial consumers imposed during evening peak hours (06.00 P.M. to 10.00 P.M.) which was imposed during the year 2008 was totally withdrawn from 05.06.2015 as per the orders of the Hon'ble Chief Minister and 24x7 power is being supplied to all categories of consumers.

Tamil Nadu met an all time high peak demand of 15,343MW and all time high energy consumption of 345.617 MU on 29.04.2016 making it the second State in the country next to Maharashtra in highest energy consumption.

Government of Tamil Nadu has also issued revocation of the directions issued towards sale of power outside Tamil Nadu under Section 11 of the Electricity Act, 2003 vide G.O. (Ms.) No.41, Energy (A1) Department, dated 31.05.2016 and accordingly private generators are permitted to sell Power to other States outside Tamil Nadu.

Furthermore, to evacuate the additional power generation and to provide quality and reliable supply, 294 substations have been commissioned and 8132.92 Ckt.kms of EHT lines and 17442 kms of HT lines have been energized at a cost of Rs.5385.92 Crores in the last five years. Also, 48.54 lakhs new Service connections have been effected.

The Hon'ble Chief Minister, ordered for provision of free electricity of 100 units bi-monthly to all Domestic consumers which has benefitted 190.90 lakh consumers.

Also, orders have been issued for enhancement in the ceiling for the supply of free electricity, to handloom services from 100 units to 200 units and to power loom services from 500 units to 750 Units bimonthly, which has benefitted 78378 handloom services and 98712 power loom services.

1.2 Roadmap for the next five years

This Government has also taken necessary steps to meet the future demand. On this front, it is envisaged to add 2500MW of Hydel power, 13,000MW of Thermal power and 3000MW of Solar power in the next five years and also to provide necessary infrastructure to evacuate power as detailed below:

1.2.1 Hydel Projects

Sl. No	Stations	Capacity in MW	Value in Rs. (Crores)
1	Sillahalla Pumped Storage Hydro Electric Project	2000	7000.00
2	Kundah pumped storage hydro-electric project (4x125MW)	500	1831.29
	Total	**2500**	8831.29

1.2.2 Thermal Projects

Sl. No	Stations	Capacity in MW	Value in Rs.(Crores)
	ONGOING PROJECTS		
1	Ennore Expansion Thermal Power Project (1 x 660 MW)	660	5421
2	Ennore SEZ Thermal Power Project	1320	9800

	(2 x 660 MW)		
3	NCTPS Stage-III (1 x 800 MW)	800	6376
4	Uppur Thermal Power Project (2 x 800 MW)	1600	12778
	NEW PROJECTS		
5	Udangudi Thermal Power Project Stage –I (2x660MW)	1320	10615
6	Udangudi Expansion Project Stage – II (2x660MW)	1320	8745
7	Udangudi Expansion Project Stage – III (2x660MW)	1320	8745
8	Ennore Replacement Thermal Power Project(1x660 MW)	660	3960
9	Kadaladi Thermal Power Project (5x800MW)	4000	24000
	Total	**13000**	**90440**

1.2.3 Solar Power

Tamil Nadu has installed capacity of 1143.412 MW as on 30.6.2016. It is proposed to increase the Solar Power further to 5000 MW in a phased manner in the next five years. This year it is proposed to establish 1200 MW of Solar Power Plants.

1.2.4 Wind Power

Tamil Nadu is a pioneer in promoting Renewable Energy in the country. Tamil Nadu, as on 30.06.2016 with an installed capacity of 7616.155 MW has the highest wind power capacity in the Country and contributes about 27 % of the country's total installed wind capacity.

An all time high generation of 4425 MW and 94.648 MU has been harnessed from wind generators on 04.07.2016. Further an additional capacity of 500 MW is proposed to be added in the near future. Also wind power projects to the tune of 1700 MW are in the pipe line.

As Tamil Nadu has a huge capacity of wind power which satisfies the Renewal Purchase Obligation (RPO), it is in a position to sell wind power to other States who require to fulfill their RPO. It is important that a dedicated inter-State Green Energy Corridor is to be established so that the surplus wind energy from Tamil Nadu can be successfully evacuated and sold to other States. In this regard, Hon'ble Chief Minister has written to the Hon'ble Prime Minister of India requesting to speed up the process of establishing the Inter-State Green Energy Corridor at the earliest to enable Tamil Nadu to transmit renewable power to other States which are in need of such power to meet out their RPO.

At present, 120 MW of wind power has been scheduled as sale of green power to other States. Further possibility of selling additional green power during the wind season is also being actively pursued.

1.2.5 Transmission Infrastructure

Sl. No	Scheme	Estimate Scheme cost Rs. in Crores
1	Establishment of 765 kV Substations at Ariyalur, North Chennai and Coimbatore District	6976.26
2	Transmission schemes for Wind Power evacuation in two Phases	
	Phase I (Sholinganallur SS and 400kV line from Kalivanthapattu - Sholinganallur)	207.95
	Phase-II (Thappakundu ,Anaikadavu , Rasipalayam SS and its associated Lines)	1306.25
3	JICA schemes	3572.93
4	Other schemes in Chennai (Mambalam and Porur)	338.08
5	Solar Power Evacuation (Kamudhi and Muthuramalingapuram)	599.80
6	Additional Transmission Schemes for evacuation of Renewable Energy - KfW funding	1593.00

7	Other schemes for system strengthening and Improvement works (400,230 kV, 110 kV substations and improvement lines)	3100.13
	Total	**17694.4**

1.3 Generation

1.3.1 Demand and Supply

The present average demand of power in the State is around 13500 MW. It is expected to go upto 14,000 MW by the end of 2016-17. This demand will be met by generation from existing power stations and power projects to be commissioned in the year 2016-17.

1.3.2 Installed capacity as on 30.06.2016

Sl No	CATEGORY	Capacity in MW
I	**Conventional energy sources**	
1	Hydro	2307.90
2	Thermal	4660.00

3	Gas	516.08
4	Central Generating Stations	5464.00
5	Power Purchases	
	Independent Power Projects	852.50
	Captive Power Projects	986.50
	Long Term Open Access	2830.00
	Medium Term Open Access	359.50
	Total Power Purchases	5028.50
	Total Conventional	**17976.48**
II	**Renewable energy sources**	
1	Wind	7616.16
2	Solar	1143.41
3	Biomass - Combustion	230.00
4	Co-generation	659.40
	Total Non- Conventional	**9648.97**
	Grand Total	**27625.45**

1.3.3 Capacity added in the last five years

Year	Projects	Capacity in MW	Commissioning date
2011-12			
	Bhavani Kattalai Barrage II	30	29.11.11
	Periyar –Vaigai SHEP II	2.5	30.01.12
	Simhadri stage II Unit 1(CGS Share)	99.5	16.09.11
	Periyar PH RMU (unit 1, 35 MW to 42 MW)	7	14.07.11
2012-13			
	Simhadri stage II Unit 2 (CGS Share)	99.5	30.09.12

	TANGEDCO -NTPC JV (500 MW) unit 1 (Vallur)	359	29.11.12
	Periyar PH RMU(unit 2, 35 MW to 42MW)	7	11.09.12
	Bhavani Barrage 2	10	26.10.12
2013-14			
	TANGEDCO -NTPC JV (500 MW) unit 2 (Vallur)	359	25.08.13
	MTPP Stage III	600	12.10.13
	NCTPS Stage II unit 1	600	20.03.14
	Periyar PH RMU (unit 3,35 MW to 42MW)	7	08.01.14
	Bhavani Kattalai	30	16.10.13

	Barrage 3		
	Periyar –Vaigai SHEP III	4	11.09.13
2014-15			
	NCTPS Stage II	600	08.05.14
	Kudankulam (1000 MW) unit 1(CGS Share)	563	31.12.14
	TANGEDCO -NTPC JV (500 MW) unit 3 (Vallur)	358	26.02.15
2015-16			
	Neyveli TS 2 Expansion (2x250 MW) – Unit I ,	271	Unit-2 22.04.15
	TANGEDCO -NLC JV Tuticorin (2x500MW) – Unit I , Unit II	439	Unit-1 18.06.15 Unit-2 29.08.15

	Bhavani Barrage 1	10	Unit–1 29.05.15
	Total	**4455.5**	
	Long Term open	**2730.0**	
	Medium Term Open Access	**300.0**	
	Renewable Energy Solar	**947.0**	
	Grand Total	**8432.5**	

1.3.4 Projects

1.3.4.1 Ongoing projects

1. ETPS Expansion (1 x 660 MW)

The total project cost is Rs.5421 crores. Letter of Intent (LoI) for EPC (Engineering Procurement Construction) contract has been issued. Project civil works are under progress. The

project is expected to be commissioned during 2018-19.

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

The total project cost is Rs.9800 crores. LoI for EPC cum debt finance contract has been issued. Work temporarily suspended due to Writ Petition filed in the High Court of Madras, for which the High Court directed re-evaluation of the tenders by TANGEDCO. Against the above orders TANGEDCO has filed a special leave petition in the Hon'ble Supreme Court for which arguments have been completed on 08.01.2016 and judgment has been reserved.

3. NCTPS Stage-III (1 x 800 MW)

The total project cost is Rs.6376 Crores. LOA issued for BTG (Boiler, Turbine, Generator) package and allied civil works on Engineering. Tender is under process for Balance of Plant

(BoP). The project is expected to be commissioned during 2019-20.

4. Uppur Thermal Power Project (2 x 800 MW)

The total cost of the project is Rs.12778 crores. LOA issued for BTG (Boiler, Turbine, Generator) package and allied civil works on Engineering. Tender is under process for Balance of Plant (BoP). The project is expected to be commissioned during 2019-20.

1.3.4.2 New Projects

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

The total project cost is Rs.10615 crores. After lodging the previous tender for EPC cum Debt Financing contract fresh tender has been called for. Due to interim stay on petition filed in High court of Madras, the due date for receipt of bids postponed till receipt of court orders for

further processing of tender. Writ Appeal filed by TANGEDCO on 07.07.15 for quashing of stay. The Honourable Madras High Court has issued an interim order in the stay petition permitting TANGEDCO to proceed with the processing of the tender dated 21.4.2015 and withholding the award of tender till further orders. The Tender is under process and will be awarded after finalization of the Tender and based on the outcome of the Court case.

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

The total cost of the project is Rs.8745 crores. Land acquisition and various other related activities are under progress. The project is expected to be commissioned during 2020-21.

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

The total cost of the project is Rs.8745 crores. Land acquisition and various other related

activities are under progress. The project is expected to be commissioned during 2020-21.

4. Ennore Replacement Thermal Power Project (1 x 660 MW)

The total cost of the project is Rs.3960 crores. Preparation of Detailed Project Report (DPR) is under progress. The project is expected to be commissioned in the year 2020-21.

5. Kadaladi Thermal Power Project, Ramanathapuram (4000MW)

The total cost of the project is Rs.24,000 crores. Detailed Project Report (DPR) is under preparation. The project is expected to be commissioned in the year 2020-21.

6. Cheyyur Ultra Mega Power Project (5 x 800 MW)

The project cost is Rs. 25,970 crores. This is an ultra mega project and the project is being developed by Government of India with private sector participation through Power Finance

Corporation.

Tamil Nadu will get 1600 MW power from the project as its share. Land acquisition is under process. The tender called for initially has been cancelled and on finalization of the revised bidding documents, MoP has planned to upload the bidding documents shortly after which tender processing will be initiated. The project is expected to be commissioned in the year 2019-20.

7. Kundah pumped storage hydro - electric project (4 x 125 MW)

The total cost of the project is Rs.1831.29 crores. All the statutory clearances required for the project have been obtained. This project is proposed to be executed in 3 phases. Execution of certain works such as Access Tunnel, cable cum ventilation Tunnel and Approach roads have been taken up and are under progress. This Project is programmed to be commissioned in 2020-21.

8. Sillahalla Pumped Storage HEP (4 x 500 MW)

The total cost of the project is Rs.7000 crores. Preparation of DPR is under progress. DPR is expected to be completed shortly and on completion of DPR the tendering process will be commenced. The Project is expected to be commissioned by 2020-21.

1.4 Coal and Coal Block

1.4.1 Coal

1. Fuel Supply Agreements have been executed by TANGEDCO with Eastern Coalfields Ltd.(ECL) & Mahanadi Coalfields Ltd.(MCL) for a total quantity of 21 MTPA (Million Tonnes Per Annum) for supply of Indian coal for all the Thermal power plants of TANGEDCO.

2. The realisation of Indian coal during 2014-15 was 13.682 Million Tonnes (70% of FSA) and during 2015-16 it was 15.579 Million

Tonnes (79% of the FSA). The Import coal purchase during 2014-15 was 7.686 Million Tonnes (MTs) and during 2015-16 was 5.849 MTs.

3. By effective management in inventory, procurement, logistics and the reduction in consumption of imported coal a saving to the tune of Rs. 1,332 crores has been achieved during 2015-16 compared with the financial year 2014-15, in spite of increase in Railway tariff and Clean energy Cess by Government of India, which gave an additional burden of Rs.429 Crores with increase in generation from 27,375 MUs to 28,380 MUs during the year 2015-16.

4. Further a saving of Rs.500 Crores has been achieved till now in imported coal procurement orders, for supplies during 2016-17.

1.4.2 Coal block allocation by Government of India

The Ministry of Coal has allocated Chandrabila coal block in Odisha on 24.02.16 which has a reserve capacity of 550 Million Tonnes to Tamil Nadu Generation and Distribution Corporation Ltd.

TANGEDCO has signed Coal Block Development and Production Agreement with Ministry of Coal on 30.03.16 for the development of Chandrabila coal block. Efforts are underway to appoint Mine Developer cum Operator for the development of the coal block

1.5 Performance of existing thermal power stations

Some of the existing thermal power stations have served more than 20 years. However due to proper maintenance, the Plant Load Factor is above average as detailed below,

Sl. No	Power Station	Plant Load Factor (%)
1	Units in Tuticorin Thermal Power Station	76.80
2	Units in Mettur Thermal Power Station I	81.01
3	Mettur Thermal Power Station II	74.49
4	Units in North Chennai Thermal Power Station I	80.39
5	Units in North Chennai Thermal Power Station II	61.65

1.6 Long term power purchases

Tamil Nadu Generation and Distribution Corporation Limited had executed 11 long term Power Purchase Agreements for procurement of 3330 MW power for fifteen years from 2014.

Out of 3330 MW, 2158 MW is from Inter-State generator and 1172 MW from Intra-State generators. Out of 2158 MW, from Inter-State generators, 1658 MW is being received. In

case of Intra State generators, 1172 MW is being received.

1.7 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. 18 MW Co-gen project at Chengalrayan Co-op. Sugar Mills Ltd., Villupuram Dist was commissioned by the Hon'ble Chief Minister on 17.02.2016. Balance 11 projects will be commissioned by March 2017.

1.8 Transmission

TANTRANSCO has planned to develop transmission infrastructure to effectively evacuate power from the existing and new power generating stations. The existing capacity of intra state transmission system is enhanced year by

year to match the capacity addition in generation and to meet the demand.

Substations 66kV & above and EHT lines in the existing network as on 30.06.2016

Sl.No	Rating	Number of substations/ EHT lines
1	400 kV	6 Nos.
2	230 kV	90 Nos.
3	110 kV	813 Nos.
4	66 kV	6 Nos.
	Total	915 Nos.
5	EHT lines	30387.916 ckt.kms

Number of substations commissioned and EHT lines energized during the last five year

Sl.No	Year	Number of substations commissioned				EHT lines Energised in ckt.kms
		400 kV	230 kV	110kV	33 kV	
1	2011-12	1	--	13	14	691.072
2	2012-13	--	2	18	11	1268.05
3	2013-14	--	4	43	28	1436.391
4	2014-15	2	4	40	28	2634.147
5	2015-16	--	9	35	33	1987.684
6.	2016-17 upto June 16		1	7	1	115.576
	Total	3	20	156	115	8132.92

1.8.1 Interstate Transmission System

NEW Grid has been connected to Southern Grid by means of Raichur-Sholapur 765kV line. Due to the concerted and tireless efforts by the Hon'ble Chief Minister, 765kV Narendra-Kohlapur, Raichur-Kurnool and Kurnool-Tiruvalam double circuit lines have been established, which enabled the power transfer to a quantum of 3330MW under LTOA for Tamil Nadu without any constraints.

1.8.2 Intra state transmission system under progress

i) In order to evacuate and to transfer the power generated in proposed North Chennai and Ennore Thermal power stations to southern districts of Tamil Nadu, a 765/400 kV Pooling station at North Chennai and a 765/400 kV Substation at Ariyalur in Sankarapuram Taluk of Villupuram District are proposed to be taken up.

ii) Work is under progress for 400 kV substations at Dharmapuri & Kamudhi and for 230 kV Substations at Muthuramalingapuram, Mambalam, Valayapatty, Jambunathapuram, Kanchipuram, Savasapuram, Kurukkathi and Mondipatty and will be completed by March 2017.

iii) Work will be taken for 400 kV SS at Pulianthope & Vellalaviduthi, and 230 kV SS at Porur, Neyveli, Samayanallur, Thuvakudi, Udanapalli, Narimanam, Thirupathur and Sankarapuram.

1.8.3 Green Energy Corridor Intra State Transmission Schemes

i) To evacuate wind power generation a separate corridor with three new 400 kV substations at Thappagundu, Anikadavu and Rasipalayam along with the associated 400 kV lines of length 830 Kms to be

connected to Dharmapuri (Palavadi) 400 kV SS are under progress and this transmission system will be commissioned by December 2016.

ii) For evacuation of Wind Power, 400 kV Substation is being constructed at Kanarpatty with connectivity to Kayathar 400 kV SS and Tirunelveli (PGCIL) 400 kV SS at a cost of Rs.247.60 Crores. Works are under progress and this transmission system will be commissioned by December 2016.

1.8.4 JICA Assistance

Establishment of five 400kV substations and twelve 230 kV substations along with the associated transmission lines have been sanctioned at a total outlay of Rs.5014 crores with the Official Development Assistance (ODA) Loan of JICA amounting to Rs.3572.93 crores.

Out of the five 400 kV substations, Works are under progress for Karamadai, Sholinganallur and Manali 400 kV substations. Works for two 400 KV substations at Guindy and Korattur will commence this year.

Out of the twelve 230 kV substations, two 230 kV substations at Alandur and Karuvalur have been commissioned. Works are under progress in respect of ten substations at Ambattur 3rd Main Road, Kumbakonam, Kinnimangalam, Raja Annamalaipuram, Poiyur, Purisai, Central(CMRL), Tiruppur, Shenbagapudur and TNEB Head Quarters substations.

1.8.5 Schemes under KfW Funding

In order to evacuate the huge quantum of the Renewable Energy (RE), TANTRANSCO has taken up establishment of a vast network of high capacity transmission lines in the State at an estimated cost of Rs.6000 crores.

Ministry of New and Renewable Energy (MNRE) has recommended assistance for creation of the transmission network infrastructure for Rs.1593 crores to Tamil Nadu. Government of India has accorded approval for a grant of Rs.637.20 Crores (40%) under National Clean Energy Fund (NCEF). Agreement with KfW was signed on 17.12.14 between Government of India and KfW (German Development Bank) for a soft loan of Rs.637.20 crores (40%) from KfW German funding. The balance Rs.318.60 crores (20%) is proposed as Equity by TANTRANSCO.

The schemes under KfW funding are proposed to be taken up in five packages.

Package –I

Thennampatti 400 kV SS – Works are under progress and will be completed by 2017-18.

Package –II

400 kV DC Line connecting Thennampatti - Kayathar 400 KV SS (56 Kms) and Kayathar 400

KV SS - Koilpatty (PGCIL SS) (43 Kms) and 4 Nos. 400 KV bay provision at Kayathar – Work will be taken up this year.

Package –III

400 kV DC Line connecting Rasipalayam & Singarapet (Palavadi) (195 Kms) and 2 Nos 400 KV bays at Palavadi SS. Works are under progress and will be completed by June 2017.

Package –IV

230 kV High Tension Transmission lines in various regions of the State with a Length of 284.9 Kms are under progress and will be completed by March 2017.

Package V

Augmentation of 230/110KV transformation capacity at existing six substations at Annupankulam, Cuddalore, Villupuram, Pudukottai, Thiruvannamalai and Sembatty.

Works are under progress and will be completed by March 2017.

1.9 Distribution

1.9.1 Efforts taken during flood/ cyclone

i. Northeast monsoon during 2015 associated with low pressure formation and cyclonic storms resulted in wide spread heavy rains. From 6.11.2015, heavy rain poured in Cuddalore, Chennai, Kancheepuram and Tiruvallur Districts. Around 640 nos. of Distribution Transformers, 10375 nos. of Poles and 715 Km conductor were damaged.

ii. Staff and contract labour (around 2350 staff) from other districts were deployed to carry out restoration works on war footing from 11.11.2015 onwards and supply was fully restored on 18.11.2015.

iii. Again heavy rain lashed out from 30.11.2015 in Chennai city and suburban areas, causing severe flooding in the substations upto a

height of 6 feet and most of the equipments/pillar boxes got inundated with water. Power supply was restored after pumping out the water in the substations, and after draining the water and attending the damages in the affected parts within 2 days by diverting officers, staff (around 4000 employees), vehicle and materials from other districts on war footing. The prompt efforts taken by TANGEDCO was widely appreciated by the Public.

1.9.2 Salient Features

During the year 2015-16, 33nos. 33 kV substations have been erected at a cost of Rs. 75.51 crores, 11,121 kms of LT lines and 3548 kms of HT lines have been energized. TANGEDCO had also effected service connections to 8.23 lakhs new consumers in the year 2015-16.

During 2016-17, upto June 2016, 1 no. 33 kV substation at a cost of Rs. 3.19 crores,

1865 kms of LT lines and 678 kms of HT lines have been energized and effected 1.93 lakhs new service connections.

Category wise total number of consumers being served in the State by TANGEDCO as on 30.06.16 is as follows:

Sl.No.	Category	Numbers in Lakhs
	HT Services	0.09
	LT Services	
1	Domestic	190.90
2	Commercial	31.77
3	Industries	6.46
4	Agriculture	20.62
5	Huts	11.37
6	Others	10.98
	Total	**272.19**

New service connections effected during the last five years

Sl.No	Years	Numbers in lakhs
1	2011-12	7.81
2	2012-13	11.95
3	2013-14	10.04
4	2014-15	8.58
5	2015-16	8.23
6	2016-17 upto June	1.93
	Total	48.54

1.9.3 Strengthening of Distribution network

TANGEDCO has taken various measures to strengthen the distribution infrastructure.

1.9.4 Re-conductoring

TANGEDCO has planned to replace the existing aged HT/LT lines at an estimated cost of Rs.1054.22 crores in a phased manner. Works are under progress and will be completed by March 2018.

1.9.5 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, Nagapattinam and Velankanni in a phased manner. To implement this scheme, loan of Rs.360 crores has been sanctioned from World Bank. Floating of Tender is under process.

1.9.6 Strengthening of distribution network through R-APDRP

The objectives of the Scheme are to provide quality and reliable power supply to the consumers and to bring down the AT&C losses

below 15%. The project has been taken up in two parts.

Part-A

Part-A (IT) has been implemented in 100 towns out of 110 towns. Balance 10 towns are proposed to be made "Go-Live" progressively in phases by December 2016.

Further under Part–A Supervisory Control and Data Acquisition (SCADA)/Distribution Management System (DMS) Control Centre equipments have been commissioned in all the 7 towns viz. Chennai, Madurai, Salem, Tiruppur, Tirunelveli, Trichy& Coimbatore. Installation and commissioning of SCADA equipments and DMS will be completed by December 2016.

Part-B:

Part-B Schemes cover erection of new substations, Transformers, Re-Conductoring of lines at 11/22 kV level, load bifurcation, feeder segregation, HVDS, RMUs, APFC panels,

sectionalizers, installation of capacitor banks and consumer meter replacement etc., in order to reduce the AT&C losses to the target level of 15% in the eligible project towns (with AT&C losses of above 15%). 100 towns of Tamil Nadu for a total value of Rs. 3445.10 Crores have been sanctioned.

Part -B works have been completed in 33 towns and are in progress in 67 towns and will be completed by March-2017.

1.9.7 Integrated Power Development Scheme (IPDS)

Integrated Power Development Scheme (IPDS), funded by MoP/GoI, is implemented in urban areas of all States, with the following objectives.

(i) 24x7 Power supply for all

(ii) AT&C Losses reduction

(iii) Electrification of all urban households

The works approved by the Monitoring Committee for an amount of Rs.1561.31 Crores are to be executed with the funding as under.

(i) Grant by MoP/GoI - 60%

(ii) Lending from Financial Institutions (FI)s - 30% (of which 50% may be given as Additional grant for successful achievement of milestones stipulated)

(iii) Utility own funds - 10%

1.9.8 Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

Government of India has launched Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) for the rural areas with following components:

a. Strengthening and augmentation of sub-transmission & distribution (ST&D).
b. Rural electrification

Ministry of Power, Government of India has approved Rs.924.12 Crores under the above scheme.

1.9.9 Energy conservation measures

1.9.9.1 Prevention of Energy Theft

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. The number of thefts detected and the amount levied

towards provisional assessment and compounding charges are detailed below,

Sl. No	Name of Squads	2014-15		2015-16	
		No. of case of Power theft	Penal charges in crores	No. of case of Power theft	Penal charges in crores
1	Ex-Servicemen	14,699	22.83	11,652	18.53
2	Enforcement Squads	3833	27.06	3803	31.26
3	Intelligence wing	82	0.96	203	1.99

1.9.9.2 Energy conservation measures (Awareness Generation)

The "Energy Conservation Day and Week" is being celebrated every year during December 14-

20. As a promotional measure, slogan on Energy conservation "SAVE ELECTRICITY" is being sent as SMS to about 1.7 Crore consumers along with SMS on payment of current consumption (CC) charges.

Training wing of TANGEDCO also emphasizes the need of Energy Conservation and also popularising the use of energy efficient lighting and star rated equipments in all training programmes / workshops / seminars.

The program of Energy conservation awareness to school students has been started throughout the State from October 2014. So far (upto May 2016) about 8.92 lakh students have been enlightened on energy conservation.

Seminar/ talk/ lecture on Energy Conservation for disseminating the knowledge and the latest technical knowhow is being taken up for central government sectors, micro/ small/

medium enterprises, private/ public sector, MNC companies and Higher educational institutions.

1.9.10 Consumer Friendly Measures

1.9.10.1 Online Payment

TANGEDCO is taking all efforts to simplify payment of electricity bills. The bill collection system is fully computerized. Online payment facility is also made available through 20 banks using net banking and credit/debit cards.

The facility for accepting the current consumption charges from consumers by post offices has been strengthened. Collections are made at 2572 post offices throughout the state.

TANGEDCO has provided the facility to pay the Electricity bill through the bank counters of Tamilnad Mercantile Bank, City Union Bank and Lakshmi Vilas Bank and mobile applications of Indian Bank, Karur Vysya Bank and City Union Bank.

TANGEDCO is also providing facility of LT Current Consumption charges collection through Urban Common Service Centres in the Chennai city from 02.05.2014 and through Tamil Nadu Arasu Cable TV Corporation from 02.02.2015. Also, this facility has been extended to ELCOT, Primary Agricultural Credit Co-operative Society Ltd(PACCS), Village Poverty Reduction Committee (VPRC) which are the agencies working under Tamil Nadu e-Governance Agency (TNeGA) and having 9120 counters throughout the State of Tamil Nadu. At present, about 51 lakh LT consumers are using these alternative modes of payment.

Collection of LT Current Consumption charges through ATMs of M/s.Tamilnad Mercantile Bank was introduced in February 2016.

The High Tension consumers are also provided with facility of paying their electricity bills through National Electronic Funds Transfer/

Real Time Gross Settlement (NEFT/RTGS). About 3000 HT consumers are paying using RTGS.

In addition, the scheme of sending messages to the mobile phones of the consumers about current consumption charges and due date of payment was launched on 12.06.14 and 1 crore SMS are sent every month.

1.9.10.2 Consumer Grievance Redressal Forum

TANGEDCO has introduced the facility to register grievances online with the Consumer Grievance Redressal Forum of the concerned circle.

1.9.10.3 Online Application

E-filing facility for registration of online LT applications have been developed and the intending/existing consumers can register their applications (New, Temporary supply, Additional and reduction of load) online by uploading application and documents.

The intending/existing consumers can avail this facility and can get the supply without visiting the TANGEDCO's office in person.

1.9.11 Call centres

Call centres for redressal of grievance on power failure are functioning at Chennai, Coimbatore, Madurai, Trichy, Erode, Tirunelveli, Nagercoil, Salem, Vellore, Kanchipuram, Karur and Tiruppur. Consumers can register their complaints by dialing 1912. A fully computerized Customer Care Centre for the entire TANGEDCO has been envisaged under R-APDRP scheme and is proposed to be established shortly. In the Proposed Customer Care Centre, it has been programmed to introduce additional facilities such as redressal of billing complaints, metering complaints, register of applications for new service connection, status enquiry of the pending applications etc.

Also, a 24 Hrs consumer redressal centre based on the instruction of the Hon'ble Chief

Minister functions in the camp office of the Hon'ble Minister for Electricity, Prohibition and Excise to attend to the grievances of the consumers. The general public can contact this centre through 044-24959525.

1.10 Financial Performance

a) The revenue deficit of TANGEDCO in 2014-15 was Rs.12756.59 crores. It has been reduced to Rs.8542.12 crores during 2015-16, subsequent to the implementation of revenue augmentation and cost control measures by TANGEDCO.

b) Due to above, the gap between Average Rate of Realisation (ARR) and Average Cost of Supply (ACS) has been reduced from Rs.2.16 per unit (in the year 2010-11) to Rs.1.09 per unit in 2015-16. It is expected to reduce to 74 paise in the current year.

c) The revenue deficit for the current financial year 2016-17 is estimated to be reduced from Rs.8542.12 crores to Rs.6374.17

crores, because of the effective cost control measures.

d) In order to improve the financial position of TANGEDCO, the Government of Tamil Nadu has continuously provided financial assistance in the form of Equity Share Capital, Tariff Subsidy, Grants under Financial Restructuring Plan, Loan assistance, etc, in the last five years. The financial assistance provided by Government of Tamil Nadu to TANGEDCO in the past five years i.e., from 2011-12 to 2015-16 are tabulated below:

(Rs.in crores)

Sl.No	**Assistance**	**2011-12 to 2015-16**
1	Tariff subsidy	23832.36
2	Equity Share Capital Assistance	15306.96

3	Government Loans	7678.16
4	Financial Restructuring Plan related Grants	3283.18
5	Other categories – Transmission scheme, Hydel Swing Subsidy, etc.	1646.28
	Total	51746.94

e) Government of Tamil Nadu has sanctioned the following financial assistance to TANGEDCO in Budget Estimate 2016-2017.

(Rs.in crores)

S.No	**Assistance**	**BE 2016-17**
1	Tariff subsidy	9007.38
2	Equity Share Capital Assistance	400.00
3	Transmission System Improvement Loans & Grants	1737.88

4	Cyclone Resilient Electrical Network under Coastal Disaster Risk Reduction Project (CDRRP) Grants	165.00
5	Hydel Swing Subsidy	125.00
6	Taking over of Bonds under FRP	2000.00
7	Interest on Bonds of TANGEDCO issued under FRP	420.74
	Total	**13856.00**

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TAMIL NADU ENERGY DEVELOPMENT AGENCY

Tamil Nadu Energy Development Agency (TEDA), functioning under the control of Energy Department was formed in the year 1985. TEDA has been working as the Nodal Agency for the promotion of renewable Energy in the State with main objectives of identification and potential estimation of renewable energy, creation of awareness among stake holders, encouragement of Research & Development, enhancement of renewable energy contribution in the overall energy mix, rendering necessary assistance for the renewable energy development and Renewable Energy policy formulation. Besides, TEDA is acting as the State Nodal Agency for channelizing central financial assistance from Ministry of New and Renewable Energy (MNRE).

Tamil Nadu is an established leader in renewable energy in the country. As on

30.06.2016, the total renewable energy installed capacity in the State is 9648.99 MW.

Sl. No.	Renewable Energy Type	Installed Capacity (MW)
1	Wind	7616.16
2	Bagasse Co generation	659.40
3	Bio Mass power	230.00
4	Solar	1143.41
Total		**9648.97**

Hon'ble Chief Minister of Tamil Nadu unveiled the ` **Tamil Nadu Solar Energy Policy 2012**' on 20th October, 2012. The objective of the policy is to create awareness among the Public and stakeholders for their active participation in the promotion and use of solar energy making the same as a people's movement. This was proposed to be achieved by installing grid tied solar systems with net metering, mandatory

installations of solar roof tops in Government buildings and by installing Solar power generating plants through PPA and REC mode arrangements. The policy also envisages the installation of all street lights and Water Supply installations in local bodies through solar power in a phased manner. Net metering has been permitted for both domestic and commercial consumers for the first time in the country.

In pursuance of the Tamil Nadu Solar Energy Policy 2012, the following unique schemes in Solar Policy are being implemented by the Government of Tamil Nadu.

2.0 Chief Minister's Solar Powered Green House Scheme:

Government of Tamil Nadu has been implementing country's unique and largest Solar Rooftop programme for the benefit of the Below Poverty Line families living in the rural areas with the provision of 3 lakh Green Houses with Solar powered lights, to be installed over a period of 5

years from 2011-12 to 2015-16 @ 60,000 houses per year. 1,95,969 houses have been provided with Solar powered home lights so far. A call centre has been functioning in the office of TEDA to register the complaints received from the beneficiaries and to resolve them.

2.1 Energising street lights with solar power:

The State has also been implementing the scheme of energising 1 lakh street lights through Solar Energy by replacing the existing lamps with LED lamps (with auto dimming provision from 10 p.m to 5 a.m) in village panjayats over a period of 5 years from 2011-2012 to 2015-2016. This project is also the first of its kind in the country. The street lights will be energized in clusters through Centralized Solar Photovoltaic (SPV) Power Plants with a grid back up and will be monitored through Remote Monitoring Unit (RMU). 38,575 street lights have been energized so far through Solar Energy.

2.2 Chief Minister's Solar Rooftop Capital Incentive Scheme:

Under this scheme, the State Government is providing a Capital Incentive of Rs. 20,000 per KWp in addition to the subsidy being provided by the Ministry of New and Renewable Energy (MNRE) for the installation of 1 KWp each grid tied solar rooftops without battery to 10,000 domestic consumers. The generated solar power can be consumed within the house or fed into the grid through net-metering arrangement.

For individual homes/flats, the solar system capacity shall be 1 kW. For the residential flats, solar system of 5kW, 10kW capacity and multiples thereof could be applied for, as group application. The application may be registered through online or the application format may be downloaded from www.teda.in/CIS for both individual and group categories separately. Sanction is also being accorded online and the beneficiary can choose the installer of his own choice from the list

of empanelled installers available in the same website. 1995 installations have been commissioned with net meter so far.

2.3 Promotion of Solar Rooftops in Government Buildings:

For the installation of Solar Rooftops in Government Buildings, technical support including bid process management is being provided by the Tamil Nadu Energy Development Agency.

2.4 Solar Rooftops in buildings of Rural Development & Panchayat Raj Department:

Tamil Nadu Energy Development Agency has empanelled installers for each district towards installation of Solar Roof Tops of 7kW/10kW capacity in Local Body/Government buildings all over Tamil Nadu. So far, a cumulative capacity of 643 kWp has been installed at a cost of Rs.535 lakhs.

2.5 Solar Rooftops in Tamil Nadu Pollution Control Board Buildings:

A cumulative capacity of 193 kW is being installed through the Tamil Nadu Energy Development Agency at 18 office buildings of Tamil Nadu Pollution Control Board in various districts of the State at a cost of Rs.173 lakhs. Out of the 18 Nos., 17 installations have been completed so far.

2.6 Solar Roof Tops in Puzhal Prison:

Government orders have been issued for the installation of a cumulative capacity of 330 kW Solar Roof Tops at Puzhal Prison complex at a total cost of Rs. 224 lakhs. Preliminary work is under progress and works will be completed by the end of November 2016.

2.7 Solar Roof Tops in Central Prisons:

Government orders have been issued for the installation of a cumulative capacity of 1875 kWp Solar Roof Tops at 7 Central Prisons, 2

Women prisons and 1 Borstal school at a total cost of Rs.2133 lakhs. Works will be taken up shortly and will be completed by end of January 2017.

2.8 Solar Roof Tops in Zonal offices of Transport Department:

Government orders have been issued for the installation of a cumulative capacity of 69 kWp Solar Roof Tops at Zonal Office buildings of Transport Department at a total cost of Rs.88 lakhs. Works will be taken up shortly and will be completed by the end of September 2016.

2.9 Solar Powered Pumping system:

A scheme for the provision of Solar agriculture pump sets with 50% of the cost as state subsidy, 30% of the cost as central subsidy and with a beneficiary contribution of 20% is being implemented by the Agriculture Engineering Department (AED). Tamil Nadu Energy Development Agency has rendered technical

support and has been facilitating in getting the Central Financial Assistance (CFA) from Ministry of New and Renewable Energy (MNRE). Sanction has been received from MNRE for the installation of 5150 pump sets during the year 2013-14 & 2014-15. Out of this, 2085 Nos. have been installed and commissioned and a total Central Financial Assistance of Rs.1100 lakhs has since been released.

2.10 Establishment of Ultra Mega Solar Park in Tamil Nadu:

Based on the Union Government's announcement during the budget session 2013-14, for setting up of 1 Ultra Mega Solar Park with an installed capacity of 500MW in Tamil Nadu, in-principle approval has been received from MNRE for the same. For a land requirement of 2500 acres, 905 acres have been identified in Ramanathapuram District. Proposal is under consideration of the State Government for the implementation of the project by TEDA. On

receipt of Government orders TEDA will implement the project.

2.11 Solar Village:

Rural feeders could be made bidirectional feeders which will feed solar power to the grid during the day time and take power from the grid during the night such that the total power generated equals the power taken from the grid. Such availability of uninterrupted electricity in villages will reduce migration to urban areas, improve education and health and will result in a diversified rural economy. To demonstrate that 100% of electricity requirement in any village could be met through solar power, Irumbai Village in Villupuram District has been selected for this purpose on a pilot basis and Government order has been issued to this effect for installing 170 KW capacity Grid connected Solar Power Plant at a total cost of Rs.206.1 lakhs. Works will be taken up and will be completed by March, 2017.

2.12 Waste to Energy Projects:

For generating energy from Industrial wastes/residues, 13 project proposals for a cumulative capacity of 3.2 MW were sanctioned by Ministry of New and Renewable Energy and a total Central Financial Assistance of Rs.130.21 lakhs has been released. Another 13 proposals for a cumulative capacity of 4.3 MW with total Central Financial Assistance of Rs.237 lakhs are awaiting sanction.

2.13 Financial Assistance available for Renewable Energy schemes

a. Solar Photovoltaic Application

Following schemes with incentives are available for encouraging Solar Photo Voltaic generation. Projects for a cumulative capacity of 72.22 MW have been commissioned and a total financial assistance of Rs.18,400 lakhs have been received in last five years.

Sl. No.	Name of the Scheme	Available Financial Assistance/ Subsidy
1	(a) Solar Photo Voltaic (SPV) Water Pumping System - DC pumps up to 2 HP >2 HP to 5 HP	 Rs.43,200/HP Rs.40,500/HP
	(b) SPV Water Pumping System - AC pumps up to 2 HP >2 HP to 5 HP >5 HP to 10 HP	 Rs.37,800/HP Rs.32,400/HP Rs.28,800/HP

2	SPV Power Plants (with battery bank @ 7.2Vah/Wp) up to 300 Wp >300 Wp to 10 kWp >10 kWp to 100 kWp	 Rs.75/Wp Rs.45/Wp Rs.39/Wp
3	SPV Power Plants (Without Battery) up to 500 kWp	Rs.22.5/Wp
4	Micro Grid up to 10 kWp	Rs.105/Wp
5	Mini Grid >10 to 500 kWp	Rs.90/ Wp
6	Street Lights through	

	SPV power Plant up to 100 kWp		Rs.75/Wp	
7	Solar lighting systems, Street lights, Home lights	LED	up to 40 Wp	Rs.120/Wp

The capital subsidy is applicable on the system cost inclusive of installation, commissioning, transportation, insurance, cost of 5 year maintenance and taxes.

b. Solar Thermal Application

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

Financial assistance to the tune of Rs.986 lakhs has been released for 7664 solar water heating systems installed with a total collector

area of 35754 sq.m during the last five years. However no financial assistance is available now for Solar Water Heating System. Sanction has been accorded for the installation of 22 Nos. Solar steam generation system having a total collector area of 2770 Sq.m with a total financial assistance of Rs. 157.49 lakhs and a sum of Rs. 95.49 lakhs has been released for the 15 installed systems.

Sl.No.	**Name of the Scheme**	**Available Financial Assistance/Subsidy**
1	Flat Plate Collectors with air as the working fluid	Rs.2400/ sq. m
2	Solar collector system for direct heating applications	Rs.3600/ sq. m
3	Concentrator with manual tracking	Rs.2100/ sq. m
4	Non- imaging	Rs.3600/ sq. m

	concentrators	
5	Concentrator with single axis tracking	Rs.5400/ sq. m
6	Concentrator with double axis tracking	Rs.6000/ sq. m

c. Bio-mass based projects

Financial assistance is 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 power projects	Rs.20 lakh x (CMW) Maximum support of Rs.1.5 Crore/Project
2	Bagasse Co-generation by	Rs.15 lakh x (CMW) Maximum support of

	Private sugar mills	Rs.1.5 Crore/Project
3	Bagasse Co-generation projects by cooperative/ public sector sugar mills	40 bar & above - Rs.40 lakhs/MW of surplus power
		60 bar & above - Rs.50 lakhs/MW of surplus power
		80 bar & above - Rs.60 lakhs/MW of surplus power (maximum support Rs.6.0 crore per project)
4	Biomass gasifier projects for Distributed/Off-grid power projects in Rural Areas (up to 2 MW)	Rs.15000 / KWe

5	Energy from Urban Industrial and Agricutural Wastes/Residues	
(i)	Power generation from Municipal Solid Waste	Rs.2.00 crore/MW (Maximum Rs.10 crore/project)
(ii)	Power generation from biogas at Sewage Treatment Plant or through bio-methanation of Urban and Agricultural Waste/ Residues	Rs.2.00 crore/MW or Bio CNG from 12000 m3 biogas/day (Maximum Rs.5 crore/project)
iii)	Biogas generation from Urban, Industrial and	Rs.0.50 crore/MWeq (12000 m3 biogas/day with maximum of

	Agricultural Wastes/Residues	Rs.5 crore/project)
(iv)	Power Generation from Biogas (engine/ gas turbine route)and production of bio-CNG for filling into gas cylinders	Rs.1.00 crore/MW or bio CNG from 12000 m3 biogas (Maximum Rs.5 crore/project)
(v)	Power Generation from Biogas Solid Industrial, Agricultural Wastes/Residues excluding bagasse through Boiler + Steam Turbine Configuration	Rs.0.20 crore/MW (Maximum Rs.1 crore /project)

d. Unnat Chulha Abhiyan (UCA) Programme

Financial assistance is available for use of biomass cook stoves providing cleaner cooking energy solutions in rural, semi-urban and urban areas using biomass as fuel for cooking.

Eligibility Criteria	Projects	Available Financial Assistance/ Subsidy
Family sized cook-stoves.	1. Natural draft	up to 40% of cost of cook stove with maximum ceiling of Rs.300 for the year 2015-16 & 2016-17
	2. Forced draft	up to 40% of cost of cook stove with maximum ceiling of Rs.600 for the year 2015-16 & 2016-17

Community Cook-stoves for Midday Meal Centre, Anganwadi, Tribal hostels etc.	1. Natural draft	up to 40% of cost of cook stove with maximum ceiling of Rs.2000 for the year 2015-16 & 2016-17
	2. Forced draft	up to 40% of cost of cook stove with maximum ceiling of Rs.4000 for the year 2015-16 & 2016-17

e. Small Wind Energy and Hybrid systems

Financial assistance is available for Small Wind Energy and Hybrid Systems for the installation of water pumping wind mills, aero-generators, wind-solar hybrid systems.

Sl. No.	Name of the Scheme	Available Financial Assistance/Subsidy
1	Small Wind Energy & Hybrid Systems (Aero-generators/ Wind - Solar Hybrid systems)	Rs.1,00,000/- per kW (for community users only)
2	Development/Up-gradation of Watermills and setting up of Micro Hydel projects upto 100 kW capacity to State Government Departments/State Nodal Agencies/Local Bodies/Cooperatives/ NGOs/Tea Garden & Individual Entrepreneurs	**1.** Mechanical output only - Rs.50,000/- per Watermill **2.** a) Electrical output (up to 5 kW) – Rs.1,50,000/- per Watermill (or) b) Both mechanical and electrical output

		(upto 5 kW) - Rs.1,50,000/- per Watermill
3	Micro Hydel Projects (up to 100 kW capacity)	Rs.1,25,000/- per kW

Note: A minimum contribution of 10% of project cost should be met by the beneficiaries/project owners for watermills.

Sanction has been accorded for the installation and commissioning of 20 Nos. of Wind-Solar Hybrid Systems with a cumulative capacity of 954 kW in the State under Small Wind Energy Hybrid Systems programme at a cost of Rs.1796 lakhs with a subsidy of Rs. 954 lakhs. 4 Nos. of Wind-Solar Hybrid systems with a cumulative capacity of 183.4 kWp have been installed so far.

2.14 International Renewable Energy Conference (RENERGY):

RENERGY (An exhibition of International significance on Renewable Energy) an annual event being organised since 2012, has emerged as the largest and the most prestigious Renewable Energy event in the Country. The RENERGY 2015 was conducted by the Tamil Nadu Energy Development Agency along with the Global Investors Meet on 9-10th September, 2015 at Chennai Trade Centre. The Renewable Energy Sector attracted huge investments during the Global Investors Meet. TEDA organised the sectoral conference on renewable energy during the event which received overwhelming response.

2.15 ACCOLADES:

National Award of Excellence, 2016 :

1. Ministry of New and Renewable Energy has felicitated Tamil Nadu Government and Tamil Nadu Energy

Development Agency with National Award of Excellence, 2016 for Roof Top Solar Power Projects in the General Category States for having installed the highest Solar Roof Top installations in the Country.

2. Tamil Nadu secured the third position in the installation of highest nos. of Concentrated Solar Technology (CST) installations.

3. Tamil Nadu secured the third place under the category of 'Maximum Installations of Small Wind Energy and Hybrid Systems for power generation by a State Nodal Agency in the country since inception'.

4. Tamil Nadu was certified for its outstanding work in the installation of maximum number of Small Wind Energy and Hybrid Systems for power generation during 2015-16.

2.16 The Association of Renewable Energy Agencies of States (AREAS) under the Ministry of New and Renewable Energy gave away the awards to Tamil Nadu State for the following achievements:

a. Highest installed capacity in Renewable Energy during the year 2014-15.

b. Highest cumulative grid connected renewable power capacity (including all technologies) in the country by the end of 31st March 2015.

c. Highest capacity addition (Third position) in grid connected bio-mass power in the country during the financial year 2014-15.

d. Highest cumulative numbers in the installation of Solar Home Lighting systems in the country (Third position) by the end of 31st March, 2015.

e. Highest cumulative numbers of Solar street lighting system in the country (Second position) by the end of 31st March, 2015.

f. Highest capacity addition off-grid bio-mass non-bagasse based plants in the country (Second position) during 2014-15.

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ELECTRICAL INSPECTORATE DEPARTMENT

The Electrical Inspectorate is responsible for ensuring compliance of the safety provisions in electrical installations 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 Department

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

i. Scrutiny of plan and design, inspection and approval for the High Voltage, Extra High Voltage electrical installations and Multistoried buildings observing the provision of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010.

ii. Calibration & Testing of electrical equipments and meters for correctness.

iii. Coordinating, regulating and enforcing the provisions of the Energy Conservation Act, 2001 (Central Act 52/2001) in the capacity of State Designated Agency for energy conservation.

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

v. Licensing of the lifts under the provisions of Tamil Nadu Lifts Act, 1997.

vi. Certification of electrical fitness to cinema buildings as per Tamil Nadu Cinema (Regulation) Rules, 1957.

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

Electrical Licensing Board attached to this department.

3.1 Performance & Revenue receipts

The performance of the Department during 2015-2016 (as on May 2016) is as follows:-

Sl.No	Services Rendered by this department	No of installations
(a)	Issued license for erection of new lifts	2994
(b)	Renewal of license for the existing lifts	13879
(c)	Issue of permission for energisation of new electrical installations	2207
(d)	Statutory inspections of High Tension installations	5242
(e)	Certification of electrical fitness to cinema buildings	577

	(Annual Inspection, Electrical License Renewal)	
(f)	Scrutiny of proposal for the new Electrical Installations and additions/Alterations of equipment in the existing installations	2121
(g)	Testing and calibrations of electrical meters	4215

The department mobilized Rs.12.9 crores of revenue from its inspection and other services. It collected Rs.126 crores of electrical tax from various generators supplying electricity to consumers other than Tamil Nadu Electricity Generation and Distribution Company as on March 2016.

3.2 Testing and Calibration

In order to undertake testing and calibration of electrical equipments, meters and

instruments, facilities are available at the Government Electrical Standards Laboratory attached to the Head Quarters office of the Electrical Inspectorate. The laboratory receives energy meters and other electrical instruments from various State Electricity Boards in our country for calibrating their accurate energy meters.

3.3 Energy Conservation

(i) Energy Conservation Building Code (ECBC)

The Energy Conservation Building Code (ECBC) launched by Ministry of Power, Government of India is a model document listing out mandatory requirement of energy efficiency in the building sector besides prescribing minimum energy efficiency standards for design and construction of commercial buildings. As per powers conferred under clause 15(a) of the Energy Conservation Act, 2001 the Government of

Tamil Nadu has constituted a technical committee for evolving technical guide lines for adoption of ECBC through local body. The committee has proposed changes in ECBC to suit local climate conditions and promotion of higher efficient lighting systems. The proposal will be implemented soon.

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

The Electrical Inspectorate has prepared Waste Heat Recovery Policy and sector specific energy savings plan for the State of Tamil Nadu to get the support of BEE under "Contribution to State Energy Conservation Fund (SECF)".

(iii) Demonstration Project on waste heat recovery system among Public Sector Rice Mills

In order to show-case energy savings potential on waste heat recovery system,

demonstration project on use of waste heat recovery equipment, namely, air preheater will be installed in 6 units of TNCSC rice mills at a total cost of Rs.20 lakhs during 2016-17. The air pre heater will recover the let out waste heat through chimney and utilize it for increasing the inlet air temperature of the boiler thereby increasing the efficiency of the boiler and reducing the fuel consumption as well as corresponding electricity consumption.

3.4 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 competent authority to issue license 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's license are classified as ESA, EA, ESB and EB grade depending upon the competency in handling High voltage. So for 24925 contractors have been issued various types of license and 209474 work men have been issued with competency certificates as on May 2016.

3.5 Improvement in service delivery of the Electrical Inspectorate

The Electrical Inspectorate will implement from this year, On-line Filing of Returns of Electricity Tax and Online Lift License Management System covering the entire State of Tamil Nadu.

The application "On-line Lift License Management'' enables that applicant seeking grant of new lift license and renewal of existing lift license to apply on-line and status of their each application can be monitored. The

development of software through ELCOT for the on-line lift licensing system has been completed. This will benefit the owners of the lifts at residential apartments, commercial complexes and office buildings.

"On-line Filing of Returns of Electricity Tax" enables the applicant to file the data required for collection of the Electricity tax On-line. It will improve the collection of electricity tax. The status of each application is intimated to applicant through e-mail and message. The development of software through ELCOT for the on-line filing of returns of electricity tax has also been completed and this package will be implemented this year.

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TAMIL NADU POWER FINANCE AND INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

The Tamil Nadu Power Finance and Infrastructure Development Corporation Limited (TNPFIDC) is wholly owned by the Government of Tamil Nadu and was incorporated in the year 1991. Tamil Nadu Power Finance Corporation is a Non-Banking Finance Company and is classified as a Public Financial Institution by the Ministry of Company Affairs, Government of India. The Corporation lends to Power Sector Projects, particularly for the schemes relating to generation, transmission and distribution infrastructure of the TANGEDCO AND TANTRANSCO. The authorized and paid-up share capital of the Company is Rs.90 crores.

4.0 Fixed Deposits:

Concern and care for the customers and consistent profit have considerably expanded the deposit base of the Company. TNPFIDC mobilizes funds from individuals as well as Institutional investors. Coupled with this fact, Tamil Nadu Power Finance Corporation offers on an average 1.50% interest rate more than the interest rates offered by the Nationalized banks and this has resulted in the substantial growth of deposits during the financial year 2015-2016. This Corporation has mobilized a sum of Rs.3,680.68 crores as net cumulative deposits from 1.4.2015 to 31.3.2016. The net deposits during the year from 1.4.2015 to 31.3.2016 has grown at a rate of 32.90%. It has gone up from Rs.11,187.27 crores at the beginning of the year to Rs.14,867.96 crores as on 31.3.2016. This includes deposits mobilized from public, Institutional deposits and the State Government Schemes. Out of the total deposits of

Rs.14,867.96 crores, the contribution from the individual investors is Rs.4,022.87 crores and the balance amount of Rs.10845.09 crores is from Institutional investors and State Government Schemes.

4.1 Rate of Interest

Tamil Nadu Power Finance Corporation is offering the following interest rates for deposits with effect from 16.11.2015.

Senior citizens (58 years and above)		Others	
Period	Rate of Interest (% per annum)	Period	Rate of Interest (% per annum)
12 Months	8.75	12 Months	8.50
24 Months	9.00	24 Months	8.75
36,48 & 60 Months	9.75	36,48 & 60 Months	9.25

4.2 Financial Assistance to TANGEDCO:

TANGEDCO is the only beneficiary of the funds mobilized by TNPFIDC. The funds mobilized by TNPFIDC are exclusively used by TANGEDCO for its generation and its related projects. The total financial assistance provided to TANGEDCO by way of hire purchase, lease and term loan since inception is Rs.46,685.39 crores up to 31.3.2016. A record high amount of Rs.10,314 crores has been provided as financial assistance to TANGEDCO in the year 2015-2016. The net loan outstanding from TANGEDCO as on 31.3.2016 is Rs.18,617.10 crores.

4.3 Deposits of the State Government Schemes:

The funds allotted for some of the State Government Schemes are invested in TNPFIDC.

1. Under the **Cash Incentive Scheme**, the School Education Department has deposited a sum of Rs.311.00 crores in the year 2015-16 to

prevent dropout of students in the Schools. Under this scheme, school going students in the Government and Government-aided schools get an incentive of Rs.1500/- per student per year for completing class 10^{th} and 11^{th} and Rs.2,000/- for appearing in class 12^{th} examination. The money is deposited with TNPFIDC and after appearing in class 12^{th} examination, the incentive along with interest of Rs.6027/- per student is transferred to the bank account of the students. In the last four years, cash incentives of Rs.913 Crores have been paid to as many as 19,47,294 students.

2. Further, under the **Bread-winning Scheme**, a sum of Rs.30.10 Crores has been deposited by the School Education Department from the year 2005 till 31.3.2016 to provide financial assistance to students at the rate of Rs.75,000/- per student studying from 1^{st} standard to 12^{th} standard in Government and Government- Aided Schools,

whose bread-winning parent died or permanently incapacitated in an accident.

3. The Social Welfare Department of the Government of Tamil Nadu is implementing a Scheme called "**Chief Minister's Girl Child Protection Scheme**". A sum of Rs.22,200/- per child is deposited under **"**One Girl Child Scheme**"** (Scheme I) and a sum of Rs.15,200/-each is deposited under "Two girl children Scheme" (Scheme II) in the name of the child. An incentive of Rs.1,800/- is given per child on completion of 5^{th} year upto 18^{th} year of deposit for her educational purposes. Under this scheme, a sum of Rs.1066.90 Crores has been deposited by the Social Welfare department from the year 2001 till 31.3.2016.

4. Under the '**Oru Kala Pooja Scheme**' implemented by the Hindu Religious and Charitable Endowments Department, a sum of Rs.110.34 crores has been deposited in Tamil Nadu Power Finance and Infrastructure

Development Corporation Ltd., to benefit 11,413 temples. An amount of Rs.1,00,000/- is deposited per temple. An interest amount of Rs.2,520/- is paid to each temple on quarterly basis for performing one pooja daily in the temples.

4.4 Financial Performance

TNPFIDC has the unique distinction of generating profit since inception. The total revenue of this Corporation during the financial year 2015-2016 is Rs.1,868.80 Crores. The net-worth of the Corporation during the financial year 2015-2016 has increased to Rs.792.00 Crores compared to Rs.738.77 Crores during the previous financial year. The corporation has so far accumulated a net profit of Rs.882.43 Crores. The provisional gross profit and profit after tax for the year 2015-2016 are Rs.143.58 crores and Rs.103.64 Crores respectively. The Corporation had declared dividend regularly from the year 1995-96 onwards and a sum of

Rs.118.15 Crores has been paid as dividend to the Government so far.

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Conclusion

From being power deficit during 2011, the State has been transformed into a power surplus State. In the last 5 years additional power of 8432.5 MW has been added to the Grid.

Tamil Nadu has met a historical high peak demand of 15,343 MW and energy consumption of 345.617 MUs on 29.04.2016 without any load shedding, restriction and control measures. On the generation front, the efforts taken by the Hon'ble Chief Minister have resulted in commissioning of the new projects, making Tamil Nadu not only a power sufficient State but also a power surplus State.

The state is giving due importance to the non renewable sector. From a longer term perspective and the need to maximally develop domestic supply options as well as the need to diversify energy sources, renewable energy is important to the Tamil Nadu energy sector. Tamil

Nadu has been in the forefront of exploiting wind energy potential in the country. Initiatives have been taken to strengthen the transmission infrastructure for evacuation of wind energy.

Due to the determined and systematic efforts vigorously pursued by the Hon'ble Chief Minister, this Government has taken necessary steps to meet the future demand. An ambitious plan for development of infrastructure has been prepared and is under implementation in the transmission and distribution sector. On this front it is envisaged to add 2500 MW of hydel power, 13000 MW of thermal power and 3000 MW of solar power in the next 5 years and also to provide necessary infrastructure to evacuate this power. Various new Conventional and Renewable

Energy projects also have been proposed and are under progress thus ensuring Tamil Nadu to

continue to be a power surplus State in future also.

P.THANGAMANI

Minister for Electricity, Prohibition and Excise

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