

# An Analysis Of Demand For Electricity And Supply Of Electricity In Tamilnadu During 1992-93 To 2012-2013

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*Abstract: Electricity is the prime mover of a modern society. It is regarded as the lifeblood of economic activities. Electricity is an essential requirement for our life. It has been recognised as a basic human need. It is a critical infrastructure on which the socio – economic development of the country depends. Supply of electricity at reasonable rate to rural India is essential for its overall development. In the first hundred years of its commercialisation, electricity was supplied to consumers by vertically integrated monopolies. It was generally felt that this was the only feasible option due to complexity as commodity and its natural monopoly aspects. The wind sector in India has seen phenomenal growth during the past few years, catapulting India to fourth position in the world in terms of wind power installations. Electricity generation in India is predominantly based on coal. India has enough coal reserves in its forests areas. However, due to strict forest clearance regulations, this coal cannot be utilized very often for power generation.*

*This paper tries to study the generation and consumption of electricity and also this study aims at analysing the demand and supply of electricity gap in the state of Tamilnadu from the year 1992-93 to 2012-13 especially after post liberalisation era.*

*Keywords: electricity, demand, supply, generation and consumption.*

## I. INTRODUCTION

Electricity plays a dominant role in the growth of any economy. Electricity is a special good and its generation and consumption have to be simultaneous, it cannot be economically stored. Another special feature of electricity is that its demand varies on hourly, daily, weekly, monthly and yearly basis. Its availability is one of the biggest inputs necessary for the sustained growth. This becomes even more important for a state like Tamil Nadu, which is one of the most industrialized and urbanised state in India. The state of Tamil Nadu is located in the southern region of India with installed electricity generation capacity of 18,382 MW (as on 31<sup>st</sup> January 2013). The state constitutes 9 per cent of the total installed electricity generation capacity of India which is mainly from fossil fuels such as coal and natural gas. The state has highest number (10.56per cent) of business enterprises in India compared to its population share of about 6per cent. The top 13 cities in Tamil Nadu are Chennai, Coimbatore,

Madurai, Trichy, Salem, Erode, Tirupur, Vellore, Tuticorin, Thanjavur, Nagercoil, and Dindigul. These cities are built-up with the presence of large and small industries that use electricity as a main source for energy for manufacturing their products and as such the demand for power in these cities are growing. With agriculture emerging as the largest consumers of power in the state, Tamil Nadu holds the distinction of being one of the first state to undertake massive rural electrification programme. Currently the Tamil Nadu Electricity Board (TNEB), a state sector enterprise, is the main energy provider and distributor. Consumers are classified as Domestic, Agriculture, Commercial, Industrial and others. Frequent increase in price of imported coal is not fitting in the cost per unit structure as promised in PPA, resulting in restricted generation. Recently Indonesia has increased the price of coal in international market. Production of gas in the Krishna Godavari (KG-D6) basin has also dropped by more than 60% from two years ago. It has resulted in lower or no power generation from gas based power plants. Severe

droughts/or less rainfall has contributed to less water level in dams which has resulted in less power generation from Hydro power plants.

## II. OBJECTIVE OF THE STUDY

- ✓ To study the consumption of electricity in Tamilnadu during 1992-93 to 2012-2013.
- ✓ To study the generation of electricity in Tamilnadu during 1992-93 to 2012-2013
- ✓ To analyse the demand and supply of electricity gap in Tamilnadu during 1992-1993-to 2012-2013.

## III. METHODOLOGY

This paper mainly attempts to study the demand for electricity, supply of electricity and the gap between demand and supply of electricity in Tamilnadu. Regression model has been used for analysis.

For this, the study mainly depended on secondary data which is collected for 21 years from the year 1992-93 to 2012-13 from the following sources:

- ✓ Tamil Nadu economic appraisal
- ✓ Statistical handbook of Tamil Nadu
- ✓ Directorate of statistics
- ✓ T.N.E.B at a glance

## IV. ANALYSIS

- ✓ The first objective of the paper is to study the total consumption of electricity in Tamilnadu.

YEARS	TOTAL CONSUMPTION OF ELECTRICITY (MU)
1992-93	19130
1993-94	20295
1994-95	23082
1995-96	24586
1996-97	25533
1997-98	26943
1998-99	27862
1999-2000	30434
2000-2001	33418
2001-2002	35,196
2002-2003	36347
2003-2004	38550
2004-2005	40638
2005-2006	43795

2006-2007	49,700
2007-2008	53,370
2008-2009	53,506
2009-2010	57,300
2010-2011	61,897
2011-2012	59,752
2012-2013	58810

SOURCE: STATISTICAL HANDBOOK OF TAMILNADU  
Table 1: Total Consumption Of Electricity In Tamilnadu (In Million Units)

The lowest amount of consumption of power by various sectors has been noticed in the year 1992-93 in the study period while 61897mw is the highest amount of consumption level during 2010-2011. Since 1992-93 the consumption of power by various sector has been increasingly continuously till the period 2010-2011 and during 2011-2012 and 2012-13 the consumption of power by different sectors has been reduced at a lowest extent. The difference of power consumption between 2010-2011 and 2011-12 is not much more.

- ✓ The second objective of the paper is to study total generation of electricity in Tamilnadu.

YEARS	TOTAL GENERATION OF ELECTRICITY (MU)
1992-93	16958.372
1993-94	17626.616
1994-95	19916.633
1995-96	21974.687
1996-97	22953.508
1997-98	23065.97
1998-99	22216
1999-2000	23549
2000-2001	25147
2001-2002	25562.201
2002-2003	24929.149
2003-2004	24113.562
2004-2005	26450.404
2005-2006	26914.779
2006-2007	29481.391
2007-2008	29241.268
2008-2009	28982.715
2009-2010	27860.857
2010-2011	25638.641
2011-2012	27942.32

25301.4074
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Source: Statistical Handbook Of Tamilnadu

Table 2: Total Generation Of Electricity (In Million Units)

In the study period, 16958.372 mw is the lesser amount of generation which is noticed in the year 1992-93 and 29481.391 mu is the highest amount of generation during 2006-2007 and since 1992-93 the continuous increase in generation of power can be observed till 1997-98 and from 2000-2001 the generation started increasing but fluctuations in the power generation.

✓ The third objective of the paper is to study the gap between demand and supply of power of power in Tamilnadu.

YEAR S	TOTAL DEMAND FOR ELECTRICITY (MU)	(% of demand)	TOTAL SUPPLY OF ELECTRICITY (MU)	(% of supply)
1992-93	19130	53.01	16958.372	46.99
1993-94	20295	53.52	17626.616	46.48
1994-95	23082	53.68	19916.633	46.32
1995-96	24586	52.80	21974.687	47.20
1996-97	25533	52.66	22953.508	47.34
1997-98	26943	53.88	23065.97	46.12
1998-99	27862	55.64	22216	44.36
1999-2000	30434	56.38	23549	43.62
2000-2001	33418	57.06	25147	42.94
2001-2002	35,196	57.93	25562.201	42.07
2002-2003	36347	59.32	24929.149	40.68
2003-2004	38550	61.52	24113.562	38.48
2004-2005	40638	60.57	26450.404	39.43
2005-2006	43795	61.94	26914.779	38.06
2006-2007	49,700	62.77	29481.391	37.23
2007-2008	53,370	64.60	29241.268	35.40
2008-2009	53,506	64.86	28982.715	35.14
2009-2010	57,300	67.28	27860.857	32.72
2010-2011	61,897	70.71	25638.641	29.29
2011-2012	59,752	68.14	27942.32	31.86

2012-2013	58810	69.92	25301.4074	30.08
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Source: Statistical Handbook Of Tamilnadu

Table 3: Total Demand And Total Supply Of Electricity In Tamil Nadu

The state was able to overcome the supply constraints and tried to maintain the power cut free status, since 1992-93 but state's peak demand for power rose to 58810 mu in 2012-13 from 19130 mu in 1992-93. The consumer's demand for power was restricted and the state went to the extent of introducing power cuts to manage the situation in summer months.

During 1992-93 the demand for power was 53.01% while the supply of power was 46.99% throughout the study period it can be noticed that the demand is more than the supply. From the year 1992-93 to 2002-03 the gap between demand and supply was less, the gap between demand and supply started increasing continuously till 2012-13. In 2012-13 the gap is much wider than its previous years.

The decline in the power supply is mainly due to the resources crunch in the state. The unseasonal and enormous rainfall had caused overflow in many reservoirs and subsequently reduced the hydel generation. The flooding occurred in the coal pits had hindered the coal harvesting and pulled down the thermal power generation consequently because the main source of power generation depends on the thermal power stations. The widening gap between demand for power and supply of has resulted in huge power cuts.

Due to widening gap between demand for power and supply of power over the last few years, Tamil Nadu has been facing massive power deficits. As a result, the state was facing huge power cuts, On an average, 3-4 hours of power cuts have been experienced by consumers in the state. The impact of this power shortage is being felt mainly by the industries, leading to a loss in efficiency and production.

#### V. A STATISTICAL TOOL IS USED TO TEST THE HYPOTHESIS THE DEMAND – SUPPLY GAP

##### REGRESSION

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics
					Sig. F Change
1	0.831	0.691	.675	8086.04718	.000

Table 4: Model Summary

R value indicates the Absolute correlation between the Demand and Supply it shows that 83.1% of correlation between demand and supply. R square indicates total accounts explains the variation about demand and supply. From the above table it is found that 69.1% variation, It implies that 30.8% less variation between demand and supply.

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	2782341659.491	1	2782341659.491	42.640	.000 <sup>b</sup>
1 Residual	1239799069.747	19	65252582.618		
Total	4022140729.238	20			

Table 4

Since the significant value is .000 which is less than .05 it indicates there is significant difference between demand and supply. Each and every year the demand and supply differs with significant variations. The significant value < 0.01 so 99% the result is confidence.

VI. FINDINGS

- ✓ The continuous rise in consumption of power by different sectors has been noticed in table no.1 and the generation of power from various sources since 1992-93 has increased with fluctuations.
- ✓ From the year 1992-93 to 2012-13 the supply of electricity is less than demand for electricity which is observed in table .3. From the year 1992-93 to 1999-2000 the demand and supply gap was not wider but from the year 2000-01 the gap between demand and supply started increasing and currently in the year 2012-13 the gap between the demand and supply is much wider than its past years.

VII. CONCLUSION

To overcome the power crisis and to fill the demand and supply gap in Tamilnadu instead of commencing new hydro power station's project with huge investment, increasing the

installed capacity of power stations, investing more capital in renovation of old plants, importation of coal and in modernising generators, purchasing power from other states, purchasing power from private sectors and purchasing power from central sector, if solar energy is tapped and if it is implemented effectively in Tamilnadu, the growing demand can be met , power deficit can be controlled and the gap between demand and supply of power can be filled in the state of Tamilnadu.

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