

# Energy Management among the Domestic Consumers of Kerala State Electricity Board Limited

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**Abstract:** Electricity supply is essential for overall industrial and economic development of the nation. The demand for electricity is increasing at a higher rate but the supply is not increasing at that rate. Energy Management is the only solution for power crisis. This paper attempts to analyse the benefits of retrofitting energy efficient fans in the house holds of Kerala. Both secondary and primary data is used for the study. Primary data is collected from 60 households of Thrissur district. Excel and SPSS packages are used for the analysis.

**Keywords:** Energy Management, Per capita consumption, Energy Efficiency

## Introduction

The Kerala State Electricity Board Limited was constituted by the Government of Kerala, under the Electricity (Supply) Act, 1948. The entity is responsible for carrying out the Generation, Transmission and Distribution of electricity in the state of Kerala. KSEB Limited has been incorporated under the Companies Act, 1956 and started operations as independent company w.e.f 1/11/2013. The generation of electricity is effected through hydro, thermal and non-conventional power projects such as wind energy, solar energy etc.

The peak demand for electricity is almost twice the off-peak demand. So more investment is required in the power projects to meet the peak demand. But the additional capacity so created for meeting the peak demand remains under-utilised during the off-peak periods.

## Statement of the problem

The demand for electricity is increasing but the supply is not increasing at that rate. Energy Management is the only solution for power crisis. This paper attempts to analyse the energy management programme of KSEBLtd.

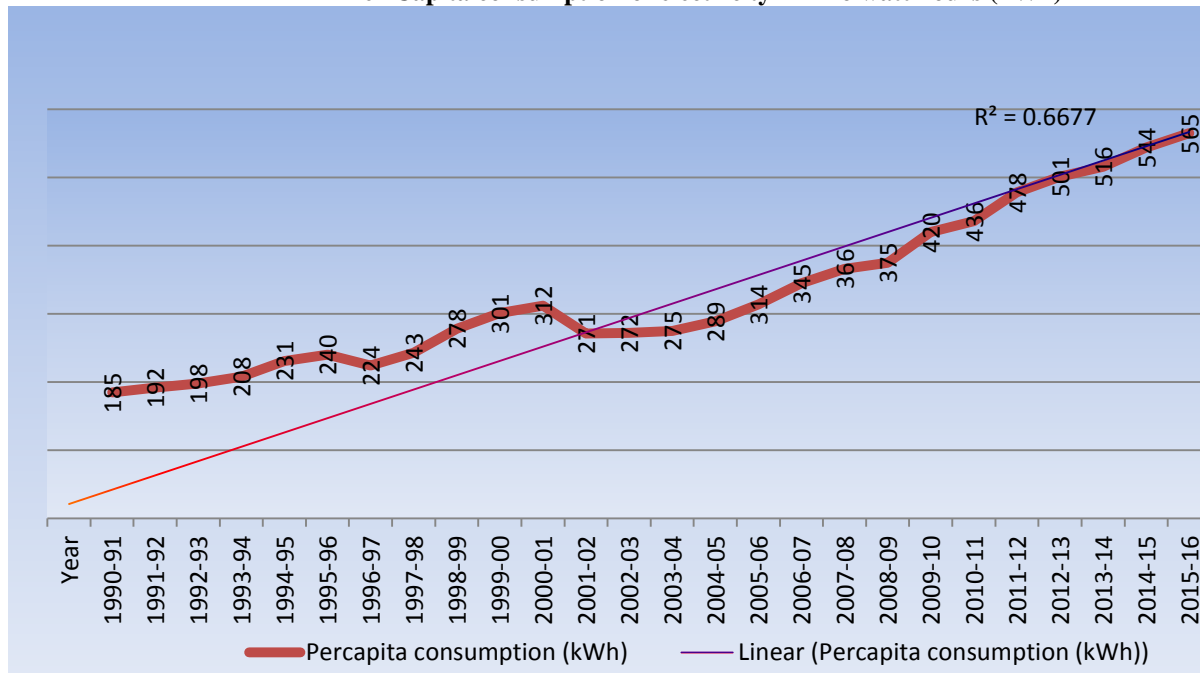
## Objectives of the study

1. To analyse the percapita consumption of electricity of the domestic consumers of KSEB Ltd.
2. To analyse the electricity saving potential of retrofitting energy efficient fans.
3. To analyse the impact of energy management programme of KSEB ltd

## Research Methodology

Both secondary and primary data is used for the study. Primary data is collected from 60 households of Viyyur Division of Thrissur district. Excel and SPSS packages are used for the analysis.

**Table 1**  
**Per Capita consumption of electricity In kilo watt hours (kWh)**



Source: Compiled from Power System Statistics, KSEB

R2 value of 0.667 is the correlation coefficient squared, the coefficient of determination between year and per capita consumption. It measures the percent of variation in the y variable due to the variation in the x variable.

**Energy Mangement Measures of KSEB Ltd.**

Energy management refers to managing the demand and supply of electricity. Kerala State Elecctricity Board is using various strategies to bring down the demand for electricity in domestic households by modifying the electricity usage. Energy efficient fans, CFL,LED distribution, energy education programmes etc are some of them.

**Benefits of Energy efficient fans**

The ordinary fans used in Kerala households are of 65watts to 110 watts of power. If they are replaced with star rated energy efficient fans the electricity savings are as follows.

Electricity consumption in Units can be calculated using the following formula :

$$1 \text{ Unit (1 Kilo watt hour)} = (\text{Power in watts} * \text{hours used}) / 1000$$

$$(110\text{watts} * 7 \text{ hours per day}) / 1000 = 7.7 \text{ Units per day}$$

$$\text{Then for 1 year electricity savings} = 2810.5 \text{ Units per fan}$$

**Impact of Replacing Ordinary fans on the Electricity Consumption of the Households of Thrissur District**

In order to analyse whether replacing ordinary fans have significantly influenced the electricity consumption of the households, a before and after study was made using paired ‘t’ test.

**H0.1: There is no significant difference in the Electricity Consumption in units before and after replacement**

**Table: 2**  
**Paired t Test**

**T Test: Two Paired Samples**

SUMMARY		Alpha			0.01		Hyp Mean	0	
Groups	Count	Mean	Std Dev	Std Err	t	df	Cohen d	Effect r	
Group 1	60	997.9587	287.4702						
Group 2	60	463.3614	129.7767						
Difference	60	534.5973	160.1178	20.67112	25.86204	59	3.338775	0.958613	

**T TEST**

	p-value	t-crit	lower	upper	sig
One Tail	0.000	2.391229			yes
Two Tail	0.000	2.661759	479.5757	589.6188	yes

Source : Primary Data

The above table reveals the result of 't-Test: Paired Two Sample for Means' used to analyse the impact of retrofitting EE fans on the electricity consumption of the households. The P value is  $0.000 < 0.01$ ; hence the  $H_0$  is rejected. (1% level of significance). The mean values of electricity use in units after replacing is less. So replacing the fans has reduced the electricity usage.

The mean value after replacement is only 463 units. The electricity savings is 534 Units. The study reveals that energy management initiatives undertaken by KSEB is successful and the same can be extended to other electrical home appliances.

**Conclusion**

An energy crisis will hinder the economic growth of the state. Energy activates machinery in factories, lights our cities and nourishes our agricultural sector. There has been an enormous increase in the demand for energy as a result of industrial development and population growth. Because of the lack of energy resources our households go without electricity for several days. This can be a severe problem during the summer when temperature become high. The study is of great significance because the consumption of energy has been rapidly increasing in Kerala which will aggravate the present energy crisis.

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