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CONSERVATION OF CONVENTIONAL ENERGY SOURCES THROUGH GREEN ENERGY IN MYSORE DISTRICT

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ABSTRACT

Energy is an important component in the process of development, which is insufficient in the modern day world. This paper tries to analyze the consumption of conventional energy unit, cost of electricity, seasonal cost, saving cost of remaining season of households of Mysore city of Karnataka. The methodology is based on Primary Data. Primary data is being collected from household's survey method, through the questionnaire in selected areas of Mysore city (Vijayanagar, Bogadhi, JPnagar and Siddarthanagar) the study used statistical techniques to analyse the before and after SWHs installation. The major findings of the study reveal that the Energy Cost analysis shows that SDWHs has reduced the cost and energy of conventional sources. To conclude, Solar Domestic Water Heater Energy Sources is better than conventional energy sources because conventional energy sources are insufficient energy and costly in the long run and also create environmental problems. So the solar domestic water heater systems are made use to protect environment, benefit the consumers, reduced the electricity cost, time saving, standard of living, solve the problem of electricity demand and help in the growth and development of the economy and achieve the sustainable development.

KEY WORDS: *Cost of Energy, Solar Energy, Solar Domestic Water Heater, Conventional Energy Consumption.*

INTRODUCTION

The Conservation of Energy consumption means the utilization of conventional energy is reduced through using Green energy products. The green energy like solar energy, wind energy, biomass energy, geothermal energy, tidal energy and waste to energy. In this paper to analysis the green energy like solar water heater has many applications. In the domestic category, it is typically used for bathing while commercial and institutional category, hot water is used for variety of purposes such as bathing, cooking and washing etc. all these hot water users influenced for the installation of the SWH system. Therefore, SWH usage is based on location, climate and economic status.

The study has used segmentation analysis for the usage of SWHs consumers. Domestic Urban Consumers category primarily consists of middle and high class population residing in ever-expanding urban areas in the Mysore city. This population is typically using electrical geysers, SWHs and fuel wood for their hot water requirement. While maximum share of the current usage of SWHs is held by the category of household consumers because, this category operated during morning period causing demand to hot water. Therefore, if consumers will be used SWHs the conventional energy can be reduced to a greater extend and also reduced is cost.

Institutional Consumers category consists of non-commercial establishments such as hostels, educational institutions, hospital, orphanages, clubs, religious places, etc., This fact should be taken into account while designing promotional schemes for SWHs. Commercial Consumers category consists of commercial establishments such as hotels, malls etc. For the study purpose, only hostel is considered. This consumer's category uses electrical heating systems for their current hot water requirement. While hot water requirement in hotels is primarily during the morning period, hot water requirement for other consumer categories is not necessarily during morning period. That fact needs to be taken into account while quantifying Demand Side Management benefits of the SWHs.

Mysore is a historical and heritage city in the state of Karnataka, and Karnataka is the 7th largest state in the Indian union. Mysore is the administrative seat of Mysore district and one of the larger districts in Karnataka. Mysore was the former capital of the kingdom of Mysore. Mysore is located at 770mtr above sea level at N12°.18[1], E 76°.42[1] and is 135 km from Bangalore, is the state capital. The challenge for Mysore is to absorb and encourage growth, without compromising on its heritage, culture and pleasant life-style. The population of Mysore city in 2001 census was 2,641,027 persons which became 3,001,127 persons by 2011 as per census 2011. The temperature ranges from 11°C to 38°C, thus the climate of Mysore district is moderate variations in temperature in different seasons.

The total area for Mysore city as per Mysore Urban Development Authority (MUDA) has shown an increase to 16789 hectares in 2011 from 9221 hectares in 2001. The city's growth in the recent years has been skewed towards southern part of Mysore i.e. the industrial areas located in Nanjangud. MUDA/private developers have developed areas like Vijayanagar and J.P. nagar. At the side of, the residential layout the private developers have lined up to develop malls, convention center and golf course. The Electricity consumption scenario in Mysore comes under the area of Chamundeshwari Electricity Supply Corporation Limited (CESC). In the year 2005, CESC carved out of MESCOM and is managing distribution of electric power for the five districts. The five districts under CESC controlled in Mysore, Chamarajanagar, Mandya, Hassan and Madakeri. CESC caters power to the world renowned industries viz., Infosys Technologies, TVS Motors, Nestle, Reid and Taylors, J.K Tyres etc. The major electricity consumption categories are residential, commercial/ institutional, municipal services. Karnataka Renewable Energy Development Limited (KREDL) was established in 1996 as a nodal agency of the Government of Karnataka to facilitate the development of Non-conventional / Renewable Energy sources in the state. KREDL is the designated Agency for Implementation of Energy Conservation Act in the state that regulates and enforces the provision contained in the Energy Conservation Act. KREDL is also a designated Agency for Clean Development Mechanism (CDM). KREDL recently established a new branch in Mysore city in 2012. Because, Mysore intends to develop Mysore city as **Solar City** as per the guidelines laid by MNRE recently announced scheme for development of solar cities, with aim to achieve minimum 10% reduction in projected demand of conventional energy.

Consumers using Electricity for Water Heating is the important requirement for hot water in domestic urban and commercial categories is met by using electricity. This demand forms part of the morning peak hour requirement for distribution Utility. If, they installation SWHs there will be in the reduction in demand on electricity network. The electricity saved due to installation on SWHs would benefit into the following consequences depending upon the demand-supply scenario of the utility.

- Reduction in load shedding by a utility during morning peak demand hours
- Reduction of energy demand – supply gap
- Reduction in costlier power purchase if the utility is self – sufficient
- SWHs Consumers are benefited the cost reduction

Consumers using Non-electric for water heating means, most of the domestic – urban, institutional consumers meet their hot water requirement using non-electricity means such as fuel oil, gas coal , biomass, fuel wood etc,. They do not use electricity for water heating, for various reasons such as high cost of electrical systems non- availability of electricity easy availability of biomass etc,. While most of the domestic and institutional consumers consume kerosene, biomass and wood waste, industrial consumers also use other fossil fuels such as fuel oil, diesel etc,.

Installation of SWHs would free compare to other technology, while avoid consumer looking into electrical geysers and improve health conditions, especially in case of women and children. There is no doubt that, from broad environmental standpoint, it makes imminent sense to convert all water heating technology from other fuels to solar. Therefore, it makes imminent sense to promote solar water heaters among domestic consumers.

However, since these consumers are currently not drawing electricity from the grid for hot water purposes, the distribution utility will not benefit due to installation of SWHs by these consumers. Therefore, it is necessary to identify suitable scheme for promoting of solar water heating systems among these consumer categories.

Rebate Scheme: The rebate scheme is reduction of cost by consumers. If, consumer's installed SWHs Government has given rebate scheme the electricity bill is some extent, which would enhance financial viability of installation of SWHs. Therefore, the government benefited to promotion for solar water system utility is helps in reducing the high cost of energy purchased from other states, to manage the little bit gap between demand and supply. However, consumers and Government are benefited by this scheme.

OBJECTIVES OF THE STUDY

1. To understand the cost related and energy consumption in Mysore city.
2. To Examine Solar Water Heater Consumption to Reduce the Energy Consumption(energy unit) in Mysore city

METHODOLOGY

The study is based on primary data only and collected from EWHs and SWHs consumers through questionnaire. This paper has focused energy cost and energy consumption from the used SWHs in Mysore city. The study has made used pair sample't' test, to examine the before electricity consumption and after(switched on SWHs) electricity consumption were selected only for domestic urban household, in respect of household's four areas such as Jayaprakash Nagar, Siddarathanagar Layout, Bogadhi and Vijayanagar. This analysis has made use of variables such as annual cost, seasonal cost and monthly cost of both technology and energy usage of consumers in Mysore city. In household's category respondents were aged between18-65 years from all the 217(sample size) households in the four areas in Mysore city of Mysore district.

RESULTS AND DISCUSSION

Table-1 Information on Cost related and Energy Consumption (Utility) and Energy Saved in Households

Sl.no.	Cost and Energy Unit per Month	Category	Frequency	Percent
1	Before Electricity Bill(cost) (Before installation of SWH)	Up to Rs.500	53	24
		Rs. 501-1000	127	59
		More than 1000	37	17
2	Before Energy Consumption (Units) (Before installation of SWH)	Up to 200units	60	28
		201-500units	121	56
		More than 500units	36	16
3	After Electricity Cost Reduction from SWHs (After installation of SWH)	Up to Rs.300	43	20
		Rs.301-500	135	62
		More than 500	39	18
4	After Electricity Unit reduction from SWHs (After installation of SWH)	Up to 100units	45	21
		101-200units	138	64
		More than 200units	34	15
5	Seasonal cost per month	Less than Rs.300	88	41
		Rs. 301 - Rs. 800	129	59

Sources: Primary survey data

Note: Households respondents no. 217(n= 217), only electricity consumers

The table-1 shows that, the information on before energy utilization usage for households, 56 percent of respondents to used electricity of the group is 201-500units, 28 percent respondents to used group of up to 200units, 16 percent respondents to used electricity more than 500unit. But after the SWHs installation, 64 percentage of respondents reduced the electricity is the group of 101-200 units, 21 percentage respondents reduced in the group of up to 100units, 15 percent reduced electricity more than 200 units.

To Examine Solar Water Heater Consumption to Reduce the Energy Consumption in Mysore city

H0: There is insignificant/equal reduction in the Energy Consumption

H1: Installation of SWHs consumption has significantly reduced Energy Consumption

This hypothesis testing is comparing EWH and SWH for two related samples of usage of energy unit of before and after installation of solar water heater. The test used paired sample test and observed that positive. If these is reduction in electricity or not in households and it is possible to solve the problem of gap between demand and supply.

Table-2 Paired Samples Test of Energy Consumption(Electricity Unit)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before Electricity unit - After Electricity unit	-0.060	0.274	0.019	-0.097	-0.023	-3.220	216	0.001

Note: significance level at 5% and 2-tailed

Above the Table-2 shows that, the paired samples test before and after electricity units. This table clearly understands that, calculated't' value is -3.220 is significant at 5% level and 2-tailed test. Therefore, it rejects the null hypothesis at 5% level of significant and accepts the alternative hypothesis. Therefore, electricity units will be reduced after installation of SWHs technology. In other words after installation of SWHs there is reduction in the electricity unit. There is significantly (positive) reduced in electricity unit after installation of SWHs and it has also helped to manage the gap between demand and supply in Mysore city.

CONCLUSION

The study of solar water heater is positive reduction is Energy consumption after installation of SWHs to manage the Demand and supply in Mysore city. It means, before electricity units is reduced the after installation of SWHs technology. SWH has positive impact on economic viability it is cost effectiveness when compared to the conventional energy. The Results of paired samples test is before and after electricity cost gives before electricity bill of cost is impact on after installation of SWHs technology. It means, after installation of SWHs was reduced the electricity cost.

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