International Journal of Transformation in Tourism & Hospitality Management and Cultural Heritage
Vol. 5, Issue-2 [*Special Issue: National E-Conference on Advances in Tourism & Hospitality Management - 2021*]
ISSN: 2581-4869

Usage of Renewable Energy Resources in Hospitality Industry: An Alternate to Energy Crisis

Mr. Manipal Singh[1], Mr. Kartik Sharma[1], Mr. Jitendra Singh[1]
[1]*Heritage Institute of Hotel and Tourism, Agra.*

Abstract

The Growing Hospitality industry has recognized as largest business industry in the world. In the recent years around 25 million people are employed every year in a tourism industrial section. To gain mental piece and joy people are taking part to show their attention towards tourism. An added feature of this step renewable energy resources are going to used to optimize energy cost. Solar Energy, Hydal Energy and other renewable energy resources may replace the conventional energy resources to increase profit of this industry.

Considering the fact that energy use is a substantial cost factor, the modest and restricted application of solar energy, geothermal energy and Biomass energy lightening is extremely alarming for achieving sustainable tourism development. The study concludes the importance of Renewable sources of energy but in few Hotels it didn't taken at priority basis. It further pointed out that the development and operation of sustainable hotels requires properly planned and designed environmental protection practices. This paper mainly focused on utilization of resources of energy which is freely available and we will have to implement in Hotels at maximum level. The main findings of this research highlights that Hotels are increasingly considering the impact of renewable resources for saving the energy.

Keywords: Renewable Energy Resources, Environment, RES Systems etc.

Introduction

Energy is an important part for countries to accomplish sustainable development. Its eternal demand has been increased in the past decades and it continuously increases. Increase of Population, Modified lifestyle, Production growth and economic determination are few reasons for requirement of maximum energy. And it gives a result total energy usage around the world has increased by approx 45% from 1971 to 2019 (world bank 2017a, 2017b). Also according to the statistical analysis around 78.6% of the total energy consumption mainly based on resources of fossil fuels (REN 21, 2017). Maximum ignition of fossil fuels adds excessive amounts of carbon-di-oxide (CO_2) emissions into the atmosphere, which is responsible for environmental effects like global warming around the earth. In last 200 years the amount of CO_2 emission

increased by 32% and the indicated temperature of the globe has increased by 0.4-0.9 ^{o}C in the last century (Panwar et.al, 2011). Environmental humiliation, which is mainly effected by the different type of pollution and CO_2 emissions, became a big challenge in the last decade. The awareness of the issue recently garnered attention by policy makers for instance the Kyoto protocol has been introduced in 2005 for reduction of cumulative emissions of greenhouse gases which was caused by industrialized process.(2)

Environmental concerns the dependency on fossil fuels consumption is on big scale it also invites the risk of energy insecurity for important countries. In Hospitality industry fossil fuels consumption is very high. According to the survey in 2017, the oil is the mostly used fuel in the world, making-up one-third of total energy consumption. Mainly 71.6% of total oil reserves by Petroleum Exporting Countries. Long term energy security is important for feasible investments to keep the energy supply in line with economic prosperity and development. In short term energy security requires uninterrupted availability of the demand energy source and stable prices to make it affordable (IEA, 2017). (5)

Renewable Energy plays an important role for energy diversification and it is very important tool for saving energy in Hospitality industry. It helps to reduction in dependency on fossil fuels resources which imply a strong resistance against energy market shocks. Green energy also used for prevention of environmental degradation. However conversion from fossil fuel based energy to Renewable Energy production can be challenging. First difficulty to adapting Renewable Energy is the cost. There are number of financial barriers to overcome compared with fossil fuel based energy investments, for this we required higher infrastructure, Start-up and operating cost. In this context, it is very important to have a strong financial status to provide an efficient way of price discovery and funding, market liquidity and Risk Management and then financial market enhance the capital allocation. Highly developed financial system increases investment made in growing industries, while an underdeveloped financial system decreases investments made in declining industries (Wurgler, 2000). In this study mainly focused on the interactions between Renewable Energy use and Economic growth, the impact of financial development has not received the attention it deserves.(2)

By BP energy (2017) point of view, the total energy consumption growth of India approx to increase 129% by the year 2035 (). Than this number is more than double the non-OECD countries average (52%) and it also remarkably higher than other BRICKS countries as China (47%), Brazil (41%) and Russia (2%). It is again reported that India has 9% share of the world total energy consumption. Due to high population growth and rapid rise in industrial output. India will become the fastest energy consuming country by 2035. Although the energy consumption mainly dependant on the fossil fuel. India rank is 5th regarding Renewable Energy consumption. The Indian Government always focused on the latest Researches which is related to Renewable Energy like Solar Energy, Tidal Energy and Hydro Energy. Renewable Energy in India composed of hydroelectricity, non-hydroelectric renewable, biomass and waste. The biggest proportion of Renewable Energy is hydroelectricity with an increasing trend between the periods of 2005-2015.(6)

Literature Review

Renewable Energy Resources is very convenient option for Energy Saving for this **Navratil et.al. (2019)** has been conducted that Green Hotels are very better approach for Guests. He worked for increasing the visitors in Hotels by using this concept. He also introduced the six types of Renewable Energy and Solar Panels on Roof-top are got the highest preference. In his paper the visitor also found the main differentiation factor.

Kostakis et. al. (2011) Studied about developing sustainability in Greece by Willingness of Tourists to pay for Renewable Energy, He worked on the empirical analysis for Renewable Energy and this analysis is mainly based upon four subsets names are: (i) Demographic factors (ii) Economic Variables (iii) Past experience with regards to Renewable Energy Resources (iv) Variables regarding environmental awareness and information dissemination. According to his study Men are more likely to pay for Renewable Energy as compared to Women and he mainly focused on willingness to pay for Green Hotels.

G.J. Dalton et. al. (2007) also done great work in field of Renewable Energy sector like Feasibility analysis on Renewable Energy in Hotels in Queensland, Australia, he worked on thermal energy supplies in Hotels in the form of RES. He mainly focused on what amount on energy saved in Hotels by using RES. HOMER (National Renewable Energy Laboratory, US) Used and it saved energy according to daily demand. Another is wind energy conversion system (WECS) economically is very good option and more efficient on large scale (over 1000kw) and in small scale (0.1 to 100 kw). Both tools are better option for energy saving.

Nikolaos Zografakis et. Al. (2010) described about the different types of technologies and energy savings for Renewable Energy Resources in Crete. This paper includes the practices related to Renewable Energy Resources and related technology it also impact on the overall energy saving factor in Hotels and special energy & Environmental awareness campaigns, sectoral tourism programs for climate change mitigation and adaption done for energy savings.

Iker Laskurain et. Al. (2015) conducted that Fostering Renewable Energy Sources by standards for environmental and energy management. In this study he explained about two certified departments EMS and EnMS worked for energy saving. In this analization suggested that there is very little commitment to the fostering and adoption of RE in the main schemes for EMS and EnMS. Implications for policy makers, managers, consumers and other stakeholders are proposed

Methodology

Introduction

In this paper we utilizing the Renewable Energy Resources which is freely available, we obtained the natural energy in the form of heat energy and this energy called as mechanical energy than

we will convert it into electrical energy. We took data from a Hotel of overall energy consumption.

In this research our main focus is on the consumption of electricity, measure that are used to minimize the use of electricity and the effect of renewable energy on increasing hotel profit.

First of all we have gathered the data related to electricity consumption from 3 hotels from Delhi region in which we gathered the data from 5star hotels manager through systematic questionnaire. We have targeted "Executive Housekeepers & Chief engineers and other hospitality professionals for data collection.

In secondary part of our research we have collected the data related to renewal source of energy they are adopted by hotels and their future plans towards renewal resource of energy. (4)

Research Design

Exploratory research is used in this study as the main focus of the study was toward renewal energy resource in hospitality industry. The data was collected through questionnaire and field study as well. Visual aids were used for the better understanding.(8)

Participants

Total of 25 participants were participated for the smooth conduction and data collection. All the participants were hotel management graduates and some were engineers and managers in five star hotels. Systematic sampling was used to determine the sample. (6)

Location & Data Collection

The study was conducted in Delhi region, capital of India having so many 5 star hotels. Structured questionnaire was used for the data collection for this research. Manger from 5star hotels and engineers has participated in this structured questionnaire. Questions were formulated in Google form and were distributed with the participants through an email for the collection of answers of structured questionnaire. (9)

Objective of the study

1. To know more about the consumption of electricity of a 5 star hotel in Delhi region
2. To know more about the awareness of renewal energy amongst the hotel managers
3. To study the medium adopted by hotel for renewal source of energy
4. To study about how renewal source of energy is helping to increase the profit

Analysis

As discussed above in the methodology, 25 participants out of which 20 are from housekeeping and other major department and 5 are from engineering department. Following were the close ended questionnaire filled by them.

International Journal of Transformation in Tourism & Hospitality Management and Cultural Heritage
Vol. 5, Issue-2 [*Special Issue: National E-Conference on Advances in Tourism & Hospitality Management - 2021*]
ISSN: 2581-4869

The first question was asked about the electricity consumption of a five star hotel:

Table 1.Power Consumption of 5 Star Hotels in Delhi who are not using Reneal Source of Energy

S. N.	Appliances/ Utilization	Consumption in Unit/ Day	Amount / Day	Consumption in Unit/ Month	Amount / Month	Consumption in Unit /Year	Amount/ Year
1	Lighting & Decoration	544.11	4897 Rs.	16323	146910 Rs.	195880	1762920 Rs.
2	AC Plant	429.44	3865 Rs.	12883	115950 Rs.	154600	1391400 Rs.
3	Kitchen Appliances	477.77	4300 Rs.	14333	129000 Rs.	172000	1548000 Rs.
4	Restaurant Appliances	253.55	2282 Rs.	7607	68460 Rs.	91280	821520 Rs.
5	Water Chiller Plant	237.11	2134 Rs.	7113	64020 Rs.	85360	768240 Rs.
6	Misc. (if any)	21.33	192 Rs.	640	5760 Rs.	7680	69120 Rs.
7	Housekeeping Machines	519.77	4678 Rs.	15593	140340 Rs.	187120	1684080 Rs.
8	IT	184.11	1657 Rs.	5523	49710 Rs.	66280	596520 Rs.
TOTAL		**2667.222222**	24,005 Rs.	80,017	720150 Rs.	960200	8641800 Rs.

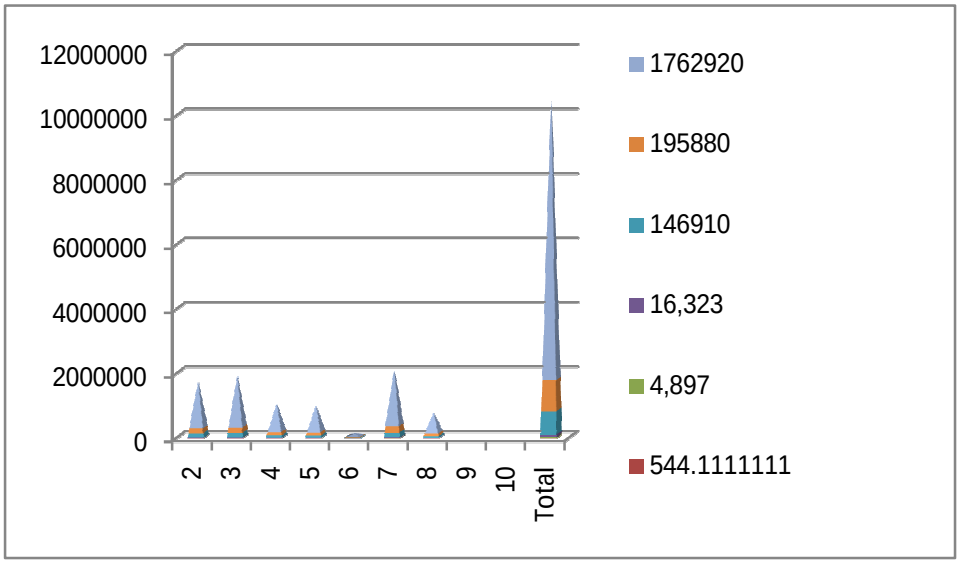

Figure 1.Electricity consumption of a five star hotel of Delhi region that are not using renewable source of energy

The electricity consumption data related to hotels that are using renewal resources:

International Journal of Transformation in Tourism & Hospitality Management and Cultural Heritage
Vol. 5, Issue-2 [*Special Issue: National E-Conference on Advances in Tourism & Hospitality Management - 2021*]
ISSN: 2581-4869

Table 2.Power Consumption of 5 Star Hotels in Delhi who are Using Reneal Source of Energy

S. No.	Appliances/ Utilization	Consumption in Unit/ Day	Amount/ Day	Consumption in Unit/ Month	Amount/ Month	Consumption in Unit/ Year	Amount/ Year
1	Lighting & Decoration	197.5714286	1,383	5,927	41490	71125.71429	497880
2	AC Plant	429.44	3865 Rs.	12883	115950 Rs.	154600	1391400 Rs.
3	Kitchen Appliances	477.77	4300 Rs.	14333	129000 Rs.	172000	1548000 Rs.
4	Restaurant Appliances	253.55	2282 Rs.	7607	68460 Rs.	91280	821520 Rs.
5	Water Chiller Plant	237.11	2134 Rs.	7113	64020 Rs.	85360	768240 Rs.
6	Misc. (if any)	21.33	192 Rs.	640	5760 Rs.	7680	69120 Rs.
7	Housekeeping Machines	519.77	4678 Rs.	15593	140340 Rs.	187120	1684080 Rs.
8	IT	184.11	1657 Rs.	5523	49710 Rs.	66280	596520 Rs.
TOTAL		**2320.68254**	20,491	69,620	614730	835445.7143	7376760

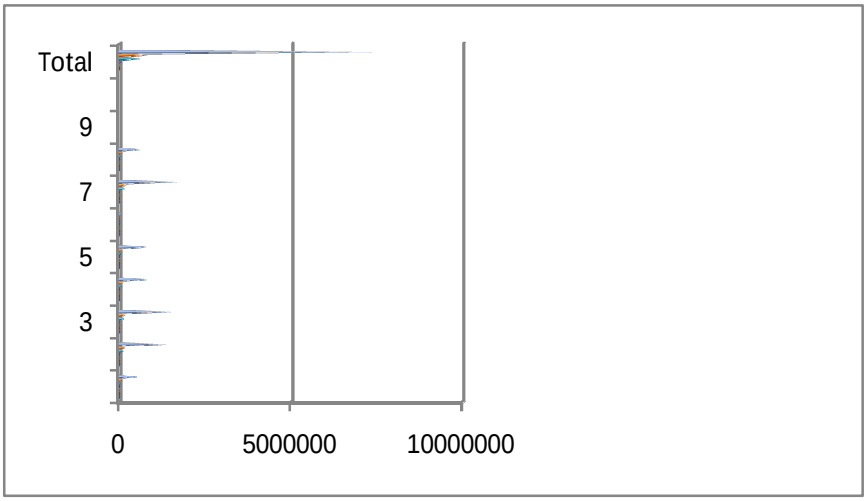

Figure 2.Power Consumption of Hotel- "The Lalit New Delhi"

The third question was asked to manager about whether they are aware about renewal energy. 25 participants were involved in this who was working on the managerial level:

Whether aware about renewal source of energy for a 5 star hotel	
YES	NO
22	3

International Journal of Transformation in Tourism & Hospitality Management and Cultural Heritage
Vol. 5, Issue-2 [*Special Issue: National E-Conference on Advances in Tourism & Hospitality Management - 2021*]
ISSN: 2581-4869

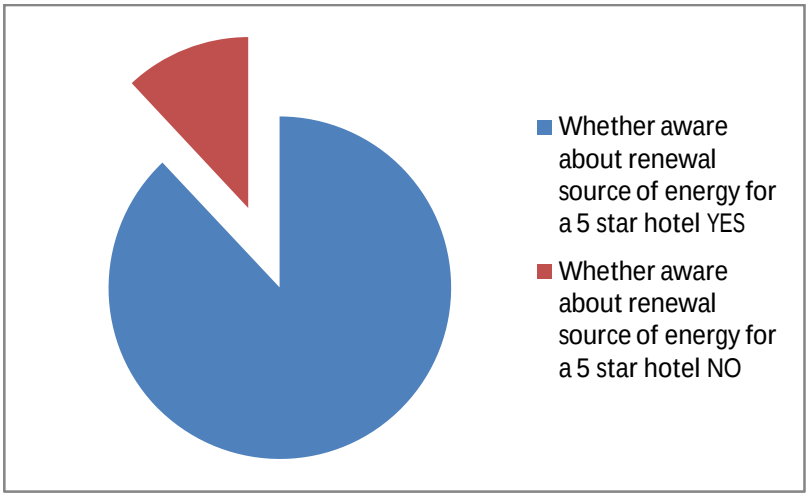

Figure 3.Knowledge related to renewal source of energy

Table 3.In The Last Part of the Research we have Collected that What All Practices or Measures the Hotels have Adopted for Renewal Source of Energy

Renewal source of energy	Hotel (1)	Hotel (2)	Hotel (3)
Solar Panels	YES	NO	NO
Hydro Power	NO	NO	NO
Biomass Energy	YES	NO	NO
Wind Energy Conversion System	NO	NO	NO

Findings

As we all are aware about that the manor expense for a five star hotel is electricity and the only source through which we can minimize it is renewal source of energy. It was observed that maximum numbers of hotels are not using the renewal source of energy as it is quite expensive. It was also observed that the managers are well aware about the renewal sources of energy and its benefits as well. Those hotels that are not using the renewal source of energy are paying more electricity bills as compare to those who are using it. It was observed the difference between the electricity bills in both the situation is more than Rs-10 Lakh Those hotels that are not using renewal source of energy are paying more electricity bills. (12)

Conclusion

Renewal source of energy is the future of hospitality industry. Few hotels have started adopting renewal source of energy but this is not possible for all the hotels as it is a very expensive investment in the initial stage but this investment turn in to profit in upcoming days. Government also started giving discounts on solar panel system etc. Initial high investment gives higher profit at the end and as human being we also must care about the environment as well.

References

1. Kostakis a, E. Sardianou b, Which factors affect the willingness of tourists to pay for renewable energy? Renewable Energy 38(2012): 169-172.
2. Ek K. Public and private attitudes towards ‘‘green’’ electricity: the case of Swedish wind power. Energy Policy 2005; 33: 1677e89.
3. Daskalaki E, Balaras CA. XENIOSda methodology for assessing refurbishment scenarios and the potential of application of RES and RUE in hotels. Energy and Buildings 2004; 36(11): 1091e105.
4. Karagiorgas M, Tsoutsos T, Moia-Pol A. A simulation of the energy consumption monitoring in Mediterranean hotels application in Greece. Energy and Buildings 2007; 39: 416e26.
5. Regional Energy Agency of Crete unpublished annual data. Crete, Greece; 2006.
6. Schendler A. Applying the principles of Industrial ecology to the guest-service sector. J. Ind. Ecol 2003; 7:127-37.
7. Chan WW. Lam JC. Prediction of pollutant emission through electricity consumption by the Hotel Industry in Hong Kong. Int. J Hosp. Manage 2002; 21: 381-91.
8. Beccali M, La Gennusa M, Lo Coco L, Rizzo G. An empirical approach for ranking environmental and energy saving measures in the hotel sector Renewable Energy 2009; 34(1): 82-90.
9. Fortuny M, Solar R, Canovas C, Sanchez A. Technical approach for a sustainable tourism development. Case study in the Balearic Islands. Journal of cleaner production 2008; 16(7): 860-9.
10. Gosslings S et. Al. The eco efficiency of tourism. Ecological Economics 2005; 54(4): 417-34.
11. Daton GJ, Lockington DA, Baldock TE. A survey of tourist attitudes to Renewable Energy supply in Australlian Hotel Accommodation. Renewable Energy 2008; 33(10): 2174-85.
12. Nina Dhirasasna, Sussen Becken, Oz sahin. A systems approach to examining the drivers and barriers of Renewable Energy Technology adoption in the Hotel sector in Queensland, Auatralia. Journal of Hospitality and Tourism Management 42(2020): 153-72.
13. Iker Laskurain, Iñaki Heras-Saizarbitoria, Martí Casadesús. “Fostering renewable energy sources by standards for environmental and energy management”. Renewable and Sustainable energy Reviews 50 (2015): 1148-1156.
14. Panwar N L, Kaushik SC, Kothari S. Role of renewable energy sources in environmental protection are view. Renew Sustain Energy Rev2011; 15 (3): 1513-24.
15. Baris Memduh Eren, Nigar Taspinar, Korhan K. Gokmenoglu. The impact of financial development and economic growth on renewable energy consumption: Empirical Analysis of India. Science of the total Environment 663 (2019): 189-197.

