Journal of Accounting Panorama (2014) 1, 115-131

An Analysis of Energy Management Practices and Accounting Implications in the Hotel Sector: A Sri Lankan Case Study

Hendahewa S M, Jayasinghe J M R P*, Pannilarathne P T, Wijewickrama M K P, Withanage C M

Abstract

Purpose – The purpose of this paper is to examine energy conservation initiatives implemented and physical/monetary environmental management accounting practices adopted in relation to energy management in the context of a Sri Lankan hotel.

Design/methodology/approach –A single case study approach was adopted for this study. Primary data were collected by conducting semi structured interviews with hotel staff along with observations. Evidence from the hotel's *Green Directory*, daily and monthly energy records, presentations on energy conservation and online resources were used as secondary data. In the process of data collection, steps were taken to ensure data validity and reliability.

Findings – The study identified that energy conservation practices, physical and monetary energy management accounting practices and performance measures of the hotel have been institutionalized and have evolved gradually over time. The contribution of accounting and finance towards the advancement of these practices is still limited and the potential for further development is significant.

Research limitations/implications –Due to limited access to confidential internal energy records, the researchers' interpretations were brought in, to illustrate and justify certain points. Further, as a result of the context-specific nature of the study, the findings are difficult to generalize across industries and are best suited for hotels with similar characteristics.

Originality/value –The study attempts to fill the dearth of research related to energy management and its accounting implications in the hotel industry in a developing country's context. The findings will be particularly useful for hotels with similar characteristics when adopting and developing a sustainable energy management system in collaboration with the finance function.

Keywords- Energy conservation, Environmental Management Accounting, sustainable management, hotel industry, Sri Lanka.

Paper type- Case Study

* Corresponding Author: E-mail: ruth.jayasinghe@yahoo.com

1. Introduction

Hotels, in general, form a retreat far away from the cares of everyday life. They are designed to provide multi-facetted comfort and services to guests. Many of the services provided to hotel guests are highly resource intensive. As a consequence, hotels, of all commercial buildings, have been found to have the highest negative impact on the environment (Rada, 1996). This knowledge, coupled with increasing concern about the natural environment and soaring energy prices, provoked the need for sustainable utilization of energy in the hotel sector. This, among many other reasons, led to the development of Sustainable Tourism, which continuously evolves with developments of mechanisms such as Environmental Management Systems (EMS). As appraised by Chan (2008), EMS is a way for management to deal with aspects that impact on the environment.

Amongst numerous fields in which EMS could be implemented, Energy and Power is considered to be conspicuous as it accounts for a significant proportion of operating costs of most business cases. In a hotel scenario energy is required for multiple sources facilitating multiple operational activities that comprise the routines of a hotel. As Maleviti *et. al.* (2011) states, hotels require various types of energy sources to operate, such as electricity, oil, liquefied petroleum gas (LPG) and natural gas. According to Maleviti *et. al* electricity is the primary energy source used in hotel facilities and is used for air-conditioning, lighting, laundry, dryers and other miscellaneous equipment used in kitchen facilities.

Therefore, it is understood that there is a high potential for preserving energy as it will be a cost saving while facilitating better environmental management. A balance between business operations and environmentally friendly initiatives should always be maintained, since poorly-implemented strategies could result in unanticipated results. As discovered by Brown, (1996) cost benefits can be achieved by operating a more "environmentally friendly" hotel. However, anecdotal evidence would suggest that of more concern to the hotelier is the impact of environmental initiatives on the perceived quality and service of the hotel.

In the Sri Lankan context, energy conservation initiatives, their applicability and success could be different to the worldwide norms. Likewise, the factors that have driven Sri Lankan companies towards such initiatives could be different. As Hunter and Wassenhove, (2011) pointed out; before seeing the firm's initiatives in detail, it will be useful to consider the Sri Lankan context at a time of post-civil war, and understand how the company's history, management organization and values faced new social pressures that threatened margins and profits in its key business units. However, despite its importance, there is a clear dearth of research in this area (Gunarathne and Lee, 2013).

Thus, a gap is identified to study energy conservation practices carried out in the Sri Lankan hotel industry. In a bid to bridge this gap, the study aims to examine the adoption and current status of energy related practices in a leading hotel in Sri Lanka and its physical and monetary accounting implications on such practices. It also strives to evaluate the performance of such measures and recognize possibility for further improvement.

The hotel that is selected in the study belongs to a well-known group of hotels based in the popular resort town of Negambo, in the West Coast of Sri Lanka. Envisioned with the hope for a greener future and sustainable tourism, the leadership of the hotel is focused and driven towards sustainable development of the hotel chain. Being a preferred tourist destination for most of the nature lovers who visit Sri Lanka, the hotel has earned a prestigious name for its best environmental management practices.

It comprises of 82 Deluxe Rooms, 21 Super Deluxe Rooms and 3 family rooms as well as 6 Sumptuous Suites. Enriched with an environment-friendly culture, the hotel has developed its position as a leading green hotel in Sri Lanka, growing and stabilizing its competitive advantage in tourism industry. From the many green initiatives adopted by the company, in this study the focus has been given towards energy preservation.

The rest of the paper is organized as follows: the next section provides the literature review. Section Three presents the methodology of the study. The Section Four presents the findings and the discussion. The last section concludes.

2. Literature Review

A growing interest towards sustainable business practices is observable in recent years. Various predictions on global warming and the massive media attention given to the matter have driven concern towards more environmentally prudent corporate activities. The Brundtland Report (World Commission on Environment and Development, 1987) provides perhaps the most widely recognized definition of sustainable development as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. While the concern for sustainable business practices is growing in many industries, the tourism sector shows above-average enthusiasm in adopting such practices.

In the field of tourism and hotel management, environmental concerns are given significant importance. As Hsieh (2012) pointed out, the hotel industry, as a significant sector of the tourism industry, also plays a major role in contributing to environmental sustainability. For example, the operations of a hotel require water,

heating, cooling, lighting, a laundry system, and appliances, all of which have a significant impact on the environment. On the other hand, hotels, especially resort hotels, rely upon the natural environment to attract tourists and to increase their profits. Under these circumstances, the need for sustainable business models, and in connection, Environmental Management Systems, have emerged in the hotel sector. Caraiani *et al*. (2005) defined Environmental Management System (EMS) as a structured approach to addressing the environmental bottom line. An EMS provides a solid framework for meeting environmental challenges and realizing the above benefits. Environmental Management Accounting (EMA) is one such mechanism that facilitates effective EMS within an organization.

In this study, the adoption of Environmental Management Accounting Practices (EMA) in the hotel sector is specifically looked at. Gunarathne and Lee (2013) found that there is a dire need for tourist organizations to follow EMA to face mounting pressure to be environmentally conscious. This requires a systematic adoption of EMA. As discussed by Letmathe and Doost (2000) an environmental cost accounting system is a flow-oriented cost accounting system which is based on a systematic cause-and-effect analysis. Especially output-related costs, such as emissions, waste disposal and waste water are assigned correctly to the inputs which cause them. Further they argued that it helps to identify and minimize environmental impacts and their costs.

Stipanuk, (1996) identified that one way to manage the environment effectively is preservation of energy. Wilco and Ho as cited in Stipanuk (1996), stated that many efforts on environmental protection work in hotels in the 1990s were a contribution of some long-standing environmental concerns such as energy conservation. Maleviti *et al*. (2011) found that due to their multiple operations, hotels, consume high amounts of electricity and oil, in the absence of renewable energy technologies and energy efficiency methods. Hence, it is important to examine and evaluate possibilities that would reduce energy consumption in hotels, evaluating also the effectiveness of energy measures.

Adoption of Energy Management systems within an organization will reward an organization in numerous ways. In the eyes of a customer there is a growing concern for the "green hotel concept". Chan and Ho (2006) claimed that 75 percent of interviewed customers claimed that they were environmentally-minded consumers and would choose hotels which showed concern for the environment. Further they stated that the most significant benefit of environmental management was the improvement in public image and better relationships with the local community. Moreover Hsieh (2012) found that governments can also learn about a firm's commitment to environmental practices. He stated that an environmentally friendly hotel can gain a competitive advantage and otherwise benefit from

reducing costs, cultivating a positive image, increasing employee loyalty, and retaining customers. However, Chan and Ho (2006) argued that many hoteliers with written environmental policies saw the greatest benefit in financial management performance.

Maleviti *et al*. (2011) observed different practices undertaken at two hotel facilities in Greece, with the intention of preserving energy. These practices range from using energy efficient bulbs to renewable energy generation. They also identified various other energy conserving practices such as thermal insulation, renewable energy technologies installation, information for rational use of energy etc.

Xu, Chan and Qian (2012) suggested several energy related KPIs providing guidance on the aspects that should be considered in an energy management system; quality performance, hotel energy management, cost performance, energy consumption & resources saving, innovation and simple rules improvement. In the journey of reaching these KPI targets, they proposed such as improve environment and reduce CO_2 emission; stop losing money on utility bills and reduce maintenance cost.

The various energy management initiatives implemented worldwide, and its applicability in the given scenario is controversial. Only a systematic adoption of Energy Management will bring the expected results and ensure the success of the practices implemented. Thus there is a need to identify and evaluate how the selected hotel company has adopted its energy practices over time, the challenges they have come across and the areas that are open for further improvement.

3. Methodology

This section describes the, the nature of the study that determined the method and how the data was collected and analyzed. The case study method was followed as the research question was based on a contemporary real life phenomenon (Yin, 2009); i.e., how the hotel has adopted energy conservation and green practices in its operations.

Three interviews were carried out in order to gain an understanding of the energy conservation initiatives of the hotel. The interviews were unstructured in nature. Prior to conducting the visits, the hotel's official web site was explored. Also, other web sites and documents relevant to the subject area were referred to, which enabled an understanding on global energy conservation practices and benchmark standards. Conducting interviews was a mean of triangulation which ensured the reliability of data collected by the secondary sources. According to Chan (2008) while the interviews were carried out, the environmental measures being documented in the prototype check list were cross-checked and confirmed by hotel

staff including the quality assurance manager, chief engineers, department managers, chief steward, and members of the hotel's green committee. A summary of information obtained from above mentioned interviews are included in Appendix 01 and Appendix 02.

In addition to interviews, the researchers also visited the hotel's power plants, water treatment plants, solar power panels, the bio mass boiler, the garden, guest rooms, stores, laundry, etc. Observations made were matched with the descriptions and explanations given in interviews. Observation facilitated further clarification, helping to avoid bias statements.

As a secondary data collection method, document review and referencing archival records were used. In his study Chan (2008) stated that the reviewed documentation encompassed environmental management manuals, periodic reports, trade journals, CD-ROMs, training materials, energy consumption data sheets, energy-saving facilities' catalogues, energy audit reports, energy conservation reports, and proposals for research findings. Similarly, hotel's internal energy records, reports presented at the meetings, power point presentations designed for staff training on energy conservation, journals and paper articles published on hotel's green practices were referred in this study. Furthermore, a special document published by the hotel named the Green Directory was referred to.

Multiple sources of evidence including documentation, interviews and physical artifacts were used. For the purpose of observation and gathering of physical artifacts two field visits were conducted. Chan (2008) claimed that observation through field visits and physical artifacts enhanced the validity of the information collected. The study used interviews and physical artifacts as double verification devices to ensure the validity of internal data. The collected data we analyzed using the explanation building approach of Yin (2009). The next section presents the findings and the discussion of the study based on the analysis.

4. Findings and Discussion

In building up the case narrative, the factors which inspired the hotel to adopt energy conservation practices, how these practices were initiated and the challenges met during the process were identified.

Drivers for adoption of energy management (EM)

The drivers that propelled the hotel to adopt energy management practices can be mainly categorized into two, namely, market/external drivers and internal drivers.

The main external driver for the adoption of green initiatives came as a bid to save cost during a civil war period. Inspired by a vision for a greener future, the hotel commenced its operations in the late 90s, nestled in the popular resort town of Negombo, in the Western coast of Sri Lanka. From its inception the hotel had its vision towards eco-friendly initiatives. However, the country endured a political and economic unstable situation during the period of the civil war and the tsunami, which caused a major decline in the Sri Lankan tourism industry. Hence the management focus on the environment amplified, with the aim of surviving in the industry. That is, with the declining revenues, the hotel had to seek ways of minimizing operating costs. Amongst numerous means of curtailing costs such as lay-off, the hotel identified eco-friendly initiatives would allow the hotel to directly increase profits without increasing revenue. As such, the hotel initiated various strategies of environmental preservation. Among these environment preservation practices, energy preservation is given a prominent place. Money saved on energy was passed on straight to the bottom line which enabled the hotel to survive despite sluggish industry growth and macroeconomic challenges.

Another external pressure came up with escalating energy costs. Hotels utilize significant amounts of energy for daily operations and recreational activities. To intensify the situation, energy prices have been rapidly increasing in the recent years and are expected to continue in the future. As explained by Gee (1999) modest capital expenditure and good housekeeping can result in 20-30% savings on energy bills. If a similar increase in profits were to be achieved by more conventional means, such as increased sales, the turnover would need to increase by around 12-15% (Gee, 1999). Therefore, in order to grow and remain competitive in the industry, the hotel made significant investments in efficient energy consumption, which has led to substantial reductions in energy costs and other operating costs. For an instance, the impact of the recent electricity price hike announced during April 2013 has been minimize due to the energy conservation practices which have enabled the hotel to enjoy competitive advantages over its competitors.

Another external factor which drives EM practices in the hotel is its focus towards continuous excellence. The hotel has already obtained ISO 14001 for Environmental Management, and at present has launched several initiatives targeting ISO 50001 specified for Energy Management Systems (EMS). In order to comply with the requirements demanded by the standard ISO 50001 the hotel has re-engineered most of its processes and restructured its systems related to energy consumption. Furthermore, the hotel ensures continuous adherence to the developments and upgrades of the standard's requirements whilst seeking to obtain new standards in line with the hotel's focus on continuous excellence. As discussed earlier, the Sri Lankan tourism industry endured a sluggish period

during which tourists were reluctant to visit due to political instability which prevailed in the country. Hence, in order to recover from the slow-moving growth, Sri Lankan hotels were determined to outclass the regional tourist destinations. As such, international standard certifications brought in value and corporate image to the hotel which provided them a competitive advantage in attracting tourists as a more eco-friendly vacation choice, as demanded by many tourists in the current context.

Further, the hotel is envisioned to be a corporate citizen by ensuring its active compliance with ethical standards. Being energy efficient can enhance business's reputation and encourage a positive impression on consumers, employees, communities, stakeholders and all other members of the public sphere. Reduced utilization of energy could be viewed as a curtailed demand for electricity from the national grid. For instance, the hotel obtains power from the immediate transformer which allows a maximum capacity of 1000KV. But they do not intend to use the maximum capacity, enabling the neighboring community to utilize adequate capacity of power, which in turn ensures a good relationship with neighboring community.

In addition to these external forces, certain internal factors too have driven EM practices. Among them, the chairman's commitment for environmental well-being is important. The chairman himself is an inspiration for the sustainable vision of the hotel. The guidance of the chairman together with the leadership of the top management, has resulted the growth of EM becoming more than part of the job description. EM practices have developed by to the extent that it has been engraved in the culture of the hotel with total involvement of staff from all levels.

Implementation of energy conservation initiatives

Driven by the external and internal drivers the hotel implements many energy conservative activities. These activities will be discussed under ventilation and air conditioning, lighting and catering.

Important EM activities have been adopted under ventilation and air conditioning operations. An analysis of energy consumption has indicated that the hotel's electricity consumption is mainly due to air conditioning. The air conditioning machines consume 53% of total electricity usage of the hotel. Hence the hotel has implemented numerous strategies to minimize the electricity costs incurred. These strategies include, but are not limited to:

i. Improvements made in the air conditioning system, where the conventional air conditioning process has been replaced with a "Chilled Water System", which has enabled the hotel to curtail air conditioning cost significantly.

ii. Deployment of "Intelligent Thermostats" connected to a room motion sensor which detects the room occupancy and activates an "occupied temperature" or an "unoccupied temperature". The occupied temperature would be activated with the sense of occupancy i.e. the temperature preferred by the guest. When the room is unoccupied, the unoccupied temperature would be activated which the suitable humidity and air quality set by the property management. Though the resulting reduction in energy consumption using such a system is not immediate, it is significant.
iii. Draping of wooden blinds in guest rooms in order to preserve the cool atmosphere in the room which would lessen the need of high air-conditioning. The curtains and blinds are closed at the end of the day to reduce heat in rooms when receiving the early evening direct sunlight.
iv. Allowing Maximum natural ventilation in rooms to further lessen the need of high air-conditioning and ensuring windows and external doors are closed as much as possible when air-conditioning is on and encouraging guests to do the same.

Other important EM initiatives can be observed under lighting aspects. Lighting is a fundamental element of the hotel and its expense has always been accepted as inevitable. Effective and attractive lighting is essential for customer comfort and satisfaction as well as for the health and safety of staff and visitors. Yet by implementing the following lighting controls and efficient luminaries, the hotel has been able to curtail lighting energy costs.

i. Upgrading 90% of standard light bulbs to LEDs, which use up to 80% less energy and provides approximately 50,000 hours of use.
ii. Installation of occupancy sensors which help to ensure lights only operate when there is occupancy to require them. Especially useful in storerooms, offices, washrooms, corridors, and back of house areas. These occupancy sensors have enabled the hotel to maintain minimum light levels so as not to compromise health and safety.
iii. Promotion of 'Switch off' policy on lighting, so that only lighting that is being used, is left on. The hotel raises staff awareness by placing stickers above light switches and posters in staff areas (available from the Carbon Trust). Lights in unoccupied areas are switched off, without compromising health and safety implications particularly in corridors and stairwells. As part of the policy, light switches have been labeled by color code system and card-key system which guides the user to select only those lights required and the time frame which they should be switched on.

Catering aspects have also been subjected to EM initiatives. The hotel has identified the kitchen as a critical energy consuming unit which accounts for a noticeable

portion of the hotel's total energy consumption. The following initiatives have been implemented to address this issue.

i. Meter systems fixed in the freezer doors, which captures and records the number of times and the duration of the freezers opened and closed. To minimize the number of times the freezer door being opened, the hotel has formed a freezer door opening schedule and had reduced the wastage of electricity.
ii. Continuous training sessions for the kitchen staff in order to raise awareness on efficient energy consumption for kitchen appliances that consume significant amount of electricity. E.g. Equipment labeling with minimum warm up times, usage of correctly sized equipment and switch off unnecessary kitchen equipment and lights etc. These useful practices accumulate to a significant amount of saving which contributes to a substantial power saving and minimized expenditure.

In addition to the abovementioned aspects, the hotel uses alternative energy sources such as solar power, wind power and bio-gas. The hotel is equipped with 36 solar panels which generate approximately 20kw per day. The power generated by the solar panels is used for guest room lighting and boiling water, where nearly 15,000 liters of water is boiled per day using the same. Furthermore, the hotel utilizes power generated by the chiller for the air conditioning plants which is measured to be 9120kwh per month whereas the total saving is measured to be Rs.134, 396 per month. The accounting aspects here represent monetary as well as physical EMA as suggested by Burritt *el al.* (2002). The hotel's solar power generation is measured on daily basis and is continuously monitored by the Chief Engineer.

During 2011, the hotel initiated electricity generation through wind power turbines equipped with 2 wind turbines and generated electricity that was sufficient to fulfill the lighting requirement of the garden. However, due to maintenance issues, the wind turbines were removed in 2012. The hotel commenced a Sewerage Treatment Plant (STP) in 1996 which was further improved subsequently by the addition a Bio-gas production unit. Currently the cookery functions in the staff canteen are entirely powered by the Bio-gas produced in the STP.

Owing to various energy conservation practices, the hotel has been able to reduce its energy cost. Furthermore, it has been able to reduce its Carbon Footprint (CF) by 22% in 2012 compared to the corresponding previous year. The hotel is further concerned about reduction of carbon foot print and is seeking ways of neutralizing the impact as opposed to minimizing it. The implementation of these EM actions

was not without many challenges. The next section explains those challenges faced by the hotel.

Challenges faced in implementing energy conservation initiatives

Many challenges were, and still are, encountered by the hotel in implementing the EM actions mentioned in the previous section. They include structural limitations, investment requirements and recurring costs, continuous training requirements for the staff and attitudes of the guests among others.

Structural constraints of a building have been a major challenge in adopting many EM strategies. The design of a building will be a critical determinant of the energy consumption of that property. Xu *et. al.* (2012) observed this as;

> *"The hotel building is one type of large-scale public/commercial building and in general with high energy consumption, with a large potential for energy efficiency improvement. In addition, the property ownership of most hotel buildings is single, which comparing with multi-ownership in residential and office building, is easy to deliver Building Energy Efficiency Retrofit (BEER) in this type of buildings."*

The hotel under study commenced its operations in 1976 in an era when the sustainability initiatives were not highly regarded. Therefore the initial architectural design has not given significant consideration to energy conservation and sustainability concepts. The hotel now constantly faces the challenge of inability to change its structure resulting in less potential for cost savings, energy in particular.

Some energy conservation practices require a high level of investment which is another challenge the hotel faced. For instance the hotel has invested a large amount of funds on the Solar Panels and energy saving ovens used in the kitchens. Additionally, a hotel which follows green practices has to spend on recurring costs associated with such practices apart from their daily operational costs. These include costs associated with ongoing staff training, environment equipment replacement, maintenance, upgrading, periodic environmental auditing and third-party certification and so forth (Chan and Ho, 2006). Though, the hotel as a good corporate citizen has the genuine requirement to adopt sustainability practices, it faces difficulties in allocating necessary funds required for capital investment and subsequent recurring costs for these environmentally friendly initiatives.

With regard to energy conservation, the major involvement and contribution should be from the employees. To maintain continuous involvement regular training and staff awareness has to be provided, which is a major challenge faced

by the management. As Chan and Ho (2006) pointed out; in the late 1990s, a survey conducted by the United Nations and the International Hotel Association identified a lack of training resource as the major concern when introducing environmental matters to the hotel management curricula. For example, energy saving handling methods of some kitchen appliances may require additional effort of the kitchen staff and sometimes they may have a trade-off between ease of use and responsible energy consumption. This certainly requires an attitude change of the staff in order to successfully implement the practices.

Each and every guest who visits the hotel is not environmentally prudent. While some have high regards towards "green power", there are some visitors who show no interest towards such practices. Rowlands *et al*. (2002) argued that the presence of a pro-environment attitude does not necessarily lead to pro-environment action. As such it was evident that the environmental-friendly culture of the hotel has not lured the guests to be environmentally concerned. To overcome this, the staff first need to determine public perceptions of the environmental impact (of different energy sources) so that their perceptions can be shifted by means of, for example, public education and/or marketing campaigns (Rowlands *et al*., 2002). Likewise, the hotel has launched various public and guest awareness programs to educate them on how they could contribute to a more eco-friendly stay. Nonetheless, the extent to which they respond to those suggestions remains questionable.

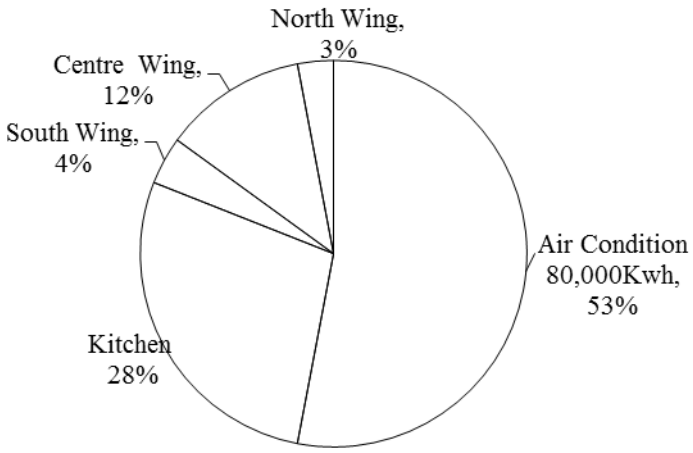
Physical and monetary accounting practices

As mentioned in the previous section the engineering and maintenance department of the hotel is responsible for planning, implementing, controlling and reporting energy conservation and green practices. The hotel employs a Naturalist for planning and advisory aspects of green practices. However, despite the presence of the accounting department, the engineering and maintenance department headed by the Chief Engineer takes initiative in reporting aspect of energy and green practices due to technical expertise required.

The staff of the engineering and maintenance department takes the responsibility in keeping records of daily and monthly consumption of water, electricity, gas and solar power in order to analyze the consumption pattern and the variances with causes. As such, the total energy consumption of the hotel is measured on daily and a monthly basis at each activity and department levels through meter readings relevant to the energy sources available and is continuously monitored by the Chief Engineer. The results and variances of the data collected are discussed and analyzed during the engineering meetings.

The hotel obtains the meter readings relevant to many energy sources. They are electricity from the main grid (departmental meter readings), electricity generated by solar power, electricity generated by wind power and other sources such as LP-Gas and bio-gas generated from the plant. As per the latest figures available as of December 2012, the total electricity consumption consists of followings (refer Figure 01).

Figure 01: Components of energy consumption



Source: Based on the Chief Engineer's records

As depicted in the above diagram it was evident that the highest level of energy is consumed to the air-conditioning operations (53%), which is common in the hotel industry. As mentioned earlier, total energy consumption of the hotel is measured, and the results and variances of the data collected are discussed and analyzed during the engineers' meetings. Subsequent to discussion on the energy consumption rates, the total amount of carbon emission is calculated and ultimately the total carbon footprint is calculated based on activities. Due to the practical difficulties, the involvement of the accounting department for the accounting aspect of energy practices is comparatively limited. However, the cost incurred for energy conservation projects are recorded by the accounting department and it is the responsibility of the engineering and maintenance department to ensure the effectiveness of the projects.

5. Conclusions

The paper demonstrates how a hotel in Sri Lanka initiated energy conversation practices and how they were implemented. It further highlights how external and internal drivers institutionalized the environmental initiatives and how those

environmentally oriented actions are sustained in the hotel sector organization. These environmental actions have been grown and developed outside the purview of accountants. In the future this calls for greater involvement of accountants in the area of environmental sustainability. However, the findings of this study will be more suited to hotel sector organizations since they posses some special characteristics. Further, findings of this study could be confined to some context specific conditions prevailed in the hotel or the hotel group. Thus, more future research is needed in the hotel sector covering hotels that represent different sizes, star gratings, locations.

The implementation of these strategies faces many challenges which in turn reduce their effectiveness. In order to overcome these challenges and to get the full potential the hotel can take actions from different fronts. Among them, obtaining volunteer customer involvement is important.

Guest rooms in a hotel account for a major part of the total area of hotels, depending on the type of facility (Lawson, 2001), and are in general characterized by energy consumption profiles difficult to predict. Guests are frequently given full control over indoor thermostat settings, individual air conditioning units, as well as operable windows and doors, and these are typically used with little or no concern for energy conservation. Therefore, in order to reap out the benefits of EMS, voluntary customer involvement is a necessity. As practiced by the Belgian Hotel group “Martin’s Hotels” (Martin’s Hotels, 2013), customer participation can be obtained to reduce the ecological footprint by suggesting useful practices for the guests under no obligation, yet with rewards. As described in the hotel website of Martin’s Hotels group, the guests are presented an "Eco Voucher" card at reception which would include several suggestions to be practice during their stay, adherence to which guests will earn points. The points can be accumulated every time the guests stay at one of the hotels, and which can be exchanged for may be products or extra facilities or discounts on services. The hotel can take initiative in using a similar project which would accumulate to greater savings by reducing the CO_2 emissions associated with water and electricity consumption.

Furthermore, the hotel could resume the wind turbine project which has been closed down in 2012 due to maintenance issues. Being benefited by the continuous wind power based in the coastal area, resuming this project will enable the hotel to achieve significant reductions in energy costs with soaring energy costs in the current context. In addition the hotel could use solar garden lamps for garden lightening so that dependence on the national grid can be reduced. Further to above, in the long run the hotel could investigate in utilization of tidal power as it is the more predictable than wind energy and solar power. The hotel being the first to implement an STP plant, equipped with the technology, knowledge and man power

this area. Being nested in the coastal area, the hotel will be of great advantage by the use of this renewable energy source. Electricity consumption could be further reduced by upgrading 100% of its lightening to LED. Currently the hotel has upgraded only 90% of its lightening to LED, whereas higher energy savings can be achieved through converting the remaining 10% of lightening as well. Despite 10% being a small portion of the total area, these could be bulbs which are switched on for a prolonged period of time. In addition to the above mentioned energy saving alternatives, it is recommended that the hotel involves 3rd party in the CF calculation in order to verify and assure the figures rather than internal control.

References

Brown, M. (1996), Environmental policy in the hotel sector: "green" strategy or stratagem?, *International Journal of Contemporary Hospitality Management,* Vol. 08 No.03, pp.18-23.

Burritt, R., Hahn, T. and Schaltegger, S. (2002), Towards a comprehensive framework for environmental management accounting: links between business actors and environmental management accounting tools, *Australian Accounting Review,* Vol. 12 No. 2, pp. 39–50.

Caraiani, C., Lungu, C. I. and Dascalu, C. (2005), *Green Accounting - a Helping Instrument in European Harmonisation of Environmental Standards,* Academy of Economic Studies of Bucharest, Bucharest.

Chan, W. W. (2009), Environmental measures for hotels' environmental management systems ISO 14001, *International Journal of Contemporary Hospitality Management,* Vol.12 No. 05, pp. 542-560.

Chan, W. W. and Ho, K. (2006), Hotel's environmental management systems (ISO 14001): Creative financing strategy, *International Journal of Contemporary Hospitality Management,* Vol.18 No.04, pp. 302-316.

Department of Climate Change. (2009), *National Greenhouse and Energy Reporting System Measurement: Technical Guidelines*, Department of Climate Change, Canberra.

Gee, D.A. (1999),"Facilities Management and Design", In Verginis, C. S. and Wood, R. C. (Ed.). *Accommodation Management: Perspectives for the International Hotel Industry,* Tourism and Hospitality Management Series, International Thomson Business, London.

Gunarathne, N. and Lee, K. (2013), Adopting and Implementing Environmental Management Accounting (EMA) Practices in the Hotel Sector: A Sri Lankan Case, A paper presented at the EMAN Global Conference, Gold Coast, Queensland.

Hseih, Y. (2012), Hotel Companies' environmental policies and practices: a content analysis of their web pages, *International Journal of Contemporary Hospitality Management,* Vol.24 No.01, pp.97-121.

Hunter, M. L. and Wassenhove, L. N. V. (2011), Hayleys PLC: corporate responsibility as stakeholder relations, *Journal of Management Development*, Vol.30 No.10, pp.968-984.

IPCCWGI – Fourth Assessment Report (2007), "Summary for policymakers", In Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M. and Miller, H.L. (Ed.). *Climate Change 2007: The Physical Science Basis,* Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, pp. 1-21.

Johnston, R. J. and Tyrrell T. J. (2007), Management exercises and trainer's note in sustainable tourism and dynamics, *International Journal of Culture, Tourism and Hospitality Research,* Vol.01 No.04, pp. 328-337.

Lawson, F. R. (2001), *Hotels and Resorts – Planning, Design and Refurbishment*, Architectural Press, UK.

Letmathe, P. and Doost R. K. (2000), Environmental cost accounting and auditing, *Managerial Auditing Journal,* Vol.15 No.08, pp.424-430.

Maleviti, E., Mulugetta, Y. and Wehrmeyer, W. (2012), Energy Consumption and attitudes for the promotion of sustainability in buildings, *International Journal of Energy Sector Management*, Vol.06 No.02, pp. 213-227.

Martin's Hotels. (2013), Tomorrow needs today, retrieved on 31.08.2013 via http://www.martins-hotels.com/en/configurator/index/tomorrow-needs-today-ecobons.

Rada. J. (1996), Designing and building eco-efficient hotels, *Green Hotelier Magazine,* Vol. 4, pp.10-11.

Rowlands, I. H., Parker, P. and Scott, D. (2002), Consumer perceptions of green power, *Journal of Consumer Marketing,* Vol.19 No.02, pp.112-129.

Stipanuk, D. M. (1996), The US lodging industry and the environment: an historical view, *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 37 No. 5, pp. 39-45.

World Commission on Environment and Development (1987), *Our Common Future*, Oxford University Press, Oxford.

Xu, P., Chan, E. H. W. and Qian, Q. K. (2012), Key performance indicators (KPI) for the sustainability of building energy efficiency retrofit (BEER) in hotel building China, *Facilities*, Vol.30 No. 9/10, pp. 432-448.

Yin, R. (2009), *Case Study Research: Design and Methods*, 4th ed., Sage, Thousand Oaks, CA.

Appendix 01

Outline of the interview carried out to obtain background information of energy conservation practices and the cultural influences.

Interviewee	Points noted
General Manager	▪ The hotel endures a culture of doing business in a way that minimizes the negative externalities. ▪ The hotel with the help of a German scientist in 1996 carried out an experiment to discover the first ever STP (Sewerage Treatment Plant) in Sri Lanka. Even though the main focus of the project was initially not energy conservation, later the STP was linked to a bio-gas plant. ▪ The explicitly identifiable energy conservation practices commenced implementation during the year 2001. ▪ With the rise of the eco-tourism post 2005, the hotel obtained various standards and practices to gain the market edge.
Naturalist	▪ The hotel's aptitude towards sustainability is revealed through employing a naturalist. ▪ Naturalist is responsible for recommendation of initiatives to reduce carbon emission. However, due to the complexity of the calculations and the technical expertise associated with energy conservation, greater responsibility lies with the Engineering and Maintenance Department.

Appendix 02

Outline of the interviews carried out to obtain data on the technical background of energy conservation practices.

Interviewee	Points noted
Chief Engineer	▪ Carries out the tasks of controlling and monitoring of energy conservation initiatives. ▪ Reports procedures and gathers meetings ▪ Conducts awareness and training programs to staff members