The Role of Energy Consumption in Hotel Operations

Arvind Upadhyay (a.upadhyay@brighton.ac.uk)

Brighton Business School, University of Brighton, UK

Celine Vadam

ESCAET-Tourism Business School, France

Abstract

Energy consumption represents between 3 percent and 6 percent of hotel operating costs and is responsible of 60 percent of its CO2 emissions. It has increased from 25-30 percent over the last decade and is forecasted to continue growing due to more demanding standards and the development of electronic equipment. It may vary with the influence of various factors including building characteristics, hotel features, location and operations. The purpose of this document is to demonstrate how hotel chains can use hotel operating agreements to regulate hotels energy consumption.

Introduction

Sustainability is currently a key topic in the hospitality industry. International hotel companies are promoting actions to make their hotels more sustainable and reduce their impact on the environment. However, they still have limited tools to constrain their structures to respect their sustainability standards.

One idea to reinforce the value of a brand's sustainability policies would be to include sustainability clauses within the operating agreements signed between the brands and their properties, defining which measures can be included (meaning the ones that can be measured and monitored) and how they can be regulated.

Energy is one sustainability issue that can be monitored and easily controlled and reduced. Moreover, even if energy costs represent a small percentage of hotel's operating costs, their reduction can provide significant increases in revenue, especially in the current economic climate where energy prices are increasing along with consumption. In terms of environmental impacts, energy is the most important source of CO2 emissions for hotels, which is a critical topic in today's sustainable challenges. Indeed, tourism is more

1

than ever a key issue for the environment. Its carbon impact on earth is currently of 2 percent, but will soon increase to 3 percent due to the fast growing tourist demand, going from 25 million travelers in 1950 to 1,035 million in 2012, and forecasted to reach 1.8 billion in 2030 according to the UNWTO, urging the tourism industry to take sustainability measures.

The purpose of this final paper is to evaluate the possibility to include energy reduction tools and actions within hotel operating contracts, in order to monitor, control and reduce energy consumption within properties. Therefore, we will first analyze what contributes to energy consumption in hotels and what measures can be taken to reduce it. Second, we will study hotel chains and their role and powers to develop sustainability in their hotels. We will also ask for their contribution in a third part where they will give us some feedback about their energy regulation strategies and their usage of operating agreements in that matter. Associating hotel chains current strategies combined with our personal analysis, will allow us to provide some recommendations and ideas to implement to help hotel chains control their hotel's energy consumption through operating agreements. To conclude, we will have a look at the challenges that the hospitality industry is facing in terms of achieving sustainability.

It has been observed that firm's focus on generic strategies (Porter, 1980) and on their core competencies (Prahalad & Hamel, 1990). This lead the firm's to outsource their non-core activities and production of low value and low-technological parts and sub-assemblies to lower cost providers. Manufacturers also compete on cost (Hayes & Wheelwright, 1984). This outsourcing has led to manufacturers transferring production to low-cost economies.

By outsourcing production firms reduce costs. However this creates other challenges. One of these is high cost due to the need to transport these outsourced goods, the environmental impact becomes greater (Green et al, 1996). Legislative and regulatory compliance requires organisations to become more sustainable and reduce environment impact. Thus firms are implementing green supply chain practices (GSCP). It is interesting to explore the antecedents and enablers, which prevailed in past and still play a vital role in green supply chain practices. This paper explores the literature on green supply chain practices and presents models for green supply chain management and green supply chain practices. The models are based on different prevalent philosophies and tools and techniques of green supply chain management and practices respectively. The paper is divided in to three main parts; Introduction, literature review and framework (which also include the discussion). Literature reviews starts with sustainable supply chain management and builds the theory for developing framework for green supply chain practices.

Energy Consumption in Hotels
In order to understand the possible improvements in hotels' energy consumption, we will analyze and define how energy is used within hotels.

What is Energy Consumption in Hotels

Energy is the second largest spending category for a hotel after employment, representing 3 percent to 6 percent of hotel operating costs and accounting for around 60 percent of its CO_2 emissions *(Source: Energy Solutions)*.

Energy consumption is influenced by various technical, architectural, local and management factors, as illustrated in the following table. All of these factors can induce significant fluctuations in energy consumption, which makes it difficult to define and estimate energy targets in the hospitality industry as each hotel is different.

Table 1

Factors influencing energy consumption in hotels

Factors influencing energy consumption in hotels	Effects	Impact
Building		
Size	The bigger the building, the more energy needed.	Medium
Shape	A hotel where all is condensed in the same building will be more energy efficient than a disparate property.	Medium
Age	A new building is supposed to be better insulated than an old one.	Medium
Materials	The material used is important in terms of insulation and lightening of the building.	High
Technical equipment	The choice of technical (electronic?) appliances is important, as they are to be energy efficient to reduce energy consumption.	High
Hotel features		
Category	The higher the category, the higher the energy need (from 17.30kwhPAR* for economy to 89.35kwhPAR for luxury).	High
Facilities / Services	A hotel with only a few services and facilities will consume less energy than a hotel with a lot of services and facilities.	High
Location		
Climate	Climate will impact the use of air conditioning and heating, more necessary in hot/cold areas.	High
Local policies	Local energy policies impact the prices and CO_2 emissions, as it will determine the type of energy used: gas, electricity, nuclear, wind…	High
Operations		
Energy management	The hotel's energy management policy is crucial in controlling energy costs, as it will involve all the parties (staff, investors, guests) and will set up targets and best practices.	High

Occupancy	Occupancy will impact the energy consumption, as more people in the building will require more energy. However, there are still spaces where energy will be required independently of the occupancy.	Medium
Operational hours	A hotel runs 24h/7. However, operational hours may impact the price of energy in certain areas (cheaper in dedicated hours).	Low

* PAR: Per Available Room

How to Reduce Energy Consumption in Hotels?
In order to reduce their energy consumption, hotels have at their disposal a range of tools and practices that can be easily implemented, depending on the state of the hotel. Hotel owners are frequently reluctant to install sustainability measures in general, especially in the more economic segments that are more cost sensitive and perceive eco-friendly measures as expensive. However, even if the cost of the following actions may vary, the impacts on the environment and the cost reduction will be significant, justifying the investments needed. Moreover, some of the suggested actions listed in the table below have no financial costs: they only need human investment and care.
It is important to point out that the difficulty in implementation and costs mentioned are informative and based on an industry average. They may vary depending if the hotel is already opened or planned and if the building is existing or not. Indeed, it is easier to include environment friendly technical requirements when planning a new-build rather than modifying the technical characteristics (shape, insulation, specific construction materials, equipment) of an already constructed building.

Table 2

Action towards energy consumption reduction implementation

Actions towards energy consumption reduction	Implementation difficulty	Cost
Room heating and hot water		
Efficient building shape	Medium	Medium
Efficient isolation	Medium	Medium
In-room thermostat	High	High
Lower heating temperature	Low	Low
Air conditioning		
Lower cooling temperature	Low	Low
Better isolation	Medium	Medium
In-room thermostat	High	High
Lower cooling when no guests	Low	Low
Lightening, TV & Radio		

Windows allowing natural light to stream in	High	High
Motion sensors	High	High
Low-consumption light bulbs	Medium	Medium
Energy savings mini bar, TV	High	High
Kitchen		
Conversion of kitchen grease into bio-dynamic fuel	Low	Medium
Energy efficient appliances	High	High
Laundry		
Towel reuse	Low	Low
Linen reuse	Low	Low
Energy efficient laundry equipment	High	High
Office		
Motion sensors	High	High
Switch off computers	Low	Low
Limited usage of electronic appliances	Low	Low
Ventilation		
Energy saving ventilation system	High	High
Use natural ventilation	Low	Low
Other		
Staff consciousness	Low	Low
Guests consciousness	Low	Low
Energy monitoring	Low	Low
Solar panels installation	Medium	High
Use of renewable energies (wind, biofuel)	Medium	High

Among the hotel chains studied, 75 percent have an eco-friendly policy or are intending to put one in place. However, what struck us when studying each company's website, is that the general sustainable engagements of the chains are hidden in their "About us – Corporate Responsibility" section, meaning that a lambda guest looking to book a hotel will not know that the chain is taking actions for the environment as he will directly go to the booking section. In addition, most of the time, the corporate responsibility section exposes the general vision and values of the company, sometimes illustrated with figures reached during the past years, but without explaining concretely what are the specific actions in place in the hotels.

Table 3

Hotel chains tools to encourage sustainability practices

Hotel chains tools to encourage sustainability practices	Impact
Operations	
Include sustainability measures in operating agreements	High

Sanctions for not respecting the sustainability measures	High
Include sustainability measures in brand standards	High
Communication	
Communicate sustainability best practices and hotels/chains measures taken towards employees	High
Communicate sustainability best practices and hotels/chains measures taken towards the industry	High
Communicate sustainability best practices and hotels/chains measures taken towards owners/investors	High
Communicate sustainability best practices and hotels/chains measures taken towards guests	High
Training	
Staff training	High
Raise guests awareness	Medium
Monitoring	
Use of a monitoring system	High
Publication of sustainability reports	Medium
Set up of sustainability targets	High
Certification	
Apply for international certification	Medium
Encourage hotels to apply for national certifications	Medium
Awards	
In-house awards to congratulate the greener hotels	Medium
Encourage hotels to apply for external awards	Medium

Focusing on energy, which is the main environmental issue of interest of this paper, the hotel chains contacted that have an eco-friendly policy in place declared that 75 to 100 percent of their portfolio is involved in energy regulation. These figures are encouraging as they include all properties, whatever the category and type of contract. Indeed, hotel chains underlined the collaborative attitude of their hotels. The remaining 25 percent of non-involved hotels are mainly due to old contracts that are still running. It is to mention that chains declared that all new properties are subject to energy measures

Focus on Hotel Operating Agreements
Among hotel chains' tools to control environment management within their hotels, operating contracts is a strong one. Indeed, operating contracts are setting up the rules and requirements a hotel needs to fulfill in order to enter a chain. Three types of contracts, explained below, are currently used in the hospitality sector. They are more or less binding depending on the type of commitment.
- **Lease/ownership**: the chain owns the property or pays rent to the building's owner in order to establish its hotel within his building. The chain is responsible for the operation of the hotel and manages the revenues. In this scenario, the chain is the master of the hotel and can easily implement policy. However, hotel chains

are currently trying to reduce the number of hotels they own or lease, as the risk and investment for them is high.

- **Management contract**: this type of agreement involves a shared commitment between the owner of the building and the chain. The owner is responsible for the building (even if the chain insures day to day maintenance) and the chain takes care of operations, for which it receives a fee from the owner, calculated as a percentage of revenues. The chain can therefore operate the hotel its way but with the owner's approval. For example, the chain can't decide to install an in-room thermostat in each room without the owner's approval, as the owner will be the one investing in this new equipment. Rather, the chain can decide to set up a towel reuse policy without asking for the owner's authorization as no costs will be involved. It is a type of contract in expansion, especially in the upscale to luxury segments, as it permits the chain to maintain a level of control with reasonable risks and investment.

- **Franchise**: franchise is the less demanding and costly type of contract for hotels. The owner pays a franchise fee to the chain for its authorization to use its brand name and benefits from its marketing and communication tools. The owner remains the operator of the property, giving to the chain only a low involvement in the hotel's operations: the chain can't decide to implement sustainability policies in the hotel, unless they are mentioned in the contract (meaning that they have been preliminary negotiated and approved by both parties). This type of contract is increasing, especially in lower categories, as it allows chains to develop quickly and with a low level of risk and investment. However, it is unusual in the upper category levels, as chains are even more careful that their high-end guests have a services and facilities of elevated quality, which they can't control with franchise agreements, as they do not manage the property.

Most of the time, **brand standards** are linked to operating agreements. It is an independent document describing the requirements a hotel should meet to enter a brand, whatever the type of contract. In that sense, brand standards and operating agreements work together, the first one setting up the standards of a brand and the second one making sure, through law, that these standards are respected. Having said that, we can see the advantage and interest of brand standards while putting in place a sustainability policy. Indeed, the flexibility and evolving status of brand standards can allow chains to adapt and be proactive towards new sustainability norms and techniques. Chains can include changes as they appear necessary and legitimate them thanks to the combination with operating agreements. For example, if a new energy norm is introduced within the industry, a chain can't change every single contract it has to include it. However, it can add it to its brand standards and all its hotels will have to consider it (as it is mention in their operating contracts that they have to respect brand standards).

Industry Outlook

After analyzing energy consumption of hotels and the responsibility of hotel chains in developing sustainability, we will have a look at the industry's practices in terms of energy management.

For the purpose of the industry outlook, we have studied the sustainability strategy of forty hotel companies, listed below, of diverse size, origin, categories and type of operations by analyzing the public information available on the Internet (corporate websites, press releases, reports). We also sent them a six-question survey in order to attain additional information about their energy policy and their opinion about the implementation of energy measures within operating agreements. Forty percent of the contacted chains replied, which is not a significant number but allowed us to make some statements and conclusions.

Conclusion

In regards to the results of this study, we can say that, despite the fact that it is still a long way to go before seeing sustainability policies implemented in every hotel, the industry is waking-up and stakeholders are starting to get involved.

Energy consumption, which represents a significant 60 percent part of hotels' CO2 emissions, benefits from monitoring systems and specific actions and measures that hotels can integrate with limited investment, producing immediate effects on their energy bills.

In that sense, including sustainable policies within brand standards, backed up by operating agreements, is a powerful tool for hotel chains to promote and implement their

sustainability policies within their properties and establish environment friendly standards. This is true, as we studied in that document, with energy measures, but can also be efficient with other factors such as waste, water, CO_2 management, employment of local people and locally sourced food and beverage.

However, sustainability measures can only work with the involvement of all stakeholders. Even if awareness on the subject is increasing, sustainability is still associated, for a part of the population, with "boring", "wellies" and "crazy expensive" and not taken as seriously as it should be. It will take time to change mentalities and make eco-friendly tools the rule and not the exception, but this can be accomplished with the involvement of all stakeholders and communication with staff, industry, investors/owners and guests. From a personal point of view, hotel chains should not shy away from talking about what they concretely do to make their hotels sustainable and communicate these actions to their guests. This may help with integrating these measures into guest's fundamental requirements for a hotel experience by generalizing these practices.

It is also important to reassure hotel owners and investors: sustainability is good for the environment and their wallets. Establishing case studies, evaluating for a range of benchmark hotels in different categories the cost for implementing a sustainability policy and the medium and long-term return on investment can help. Establishing a range of benchmark-hotels in different categories, and evaluating case studies based on the cost for implementing sustainability policies may assist in understanding trends and complications.

Even if it is one of the most important economies in the world, the hospitality industry is not bound by strong international regulation and depends mainly on the rules established in each country. A four-star hotel in France has different standards than a four-star in the United States or in China. And hotels do not all use the same measurement metrics for energy. Therefore, in an ideal world, we can imagine that an international government body may be able to harmonize and globalize hospitality policies and hotel requirements though a global hotel ranking system that would include sustainability measures.

Reference

Accor (2011), The Accor group's environmental footprint, *Earth Guest Research.*

Banyan Tree (2011), Banyan Tree Holdings Limited Sustainability Report*, Banyan Tree Holdings*.

Banyan Tree (2012), Sustainability Report, *Banyan Tree Holdings.*

Bohdanowicz P. (2006), Responsible resource management in hotels – attitudes, indicators, tools and strategies, *Doctoral Thesis KTH Engineering and Management.*

City of Melbourne (2007), Energy Wise Hotels Toolkit, *City of Melbourne, Sustainability Victoria*.

E Source (2004), *Managing Energy Costs in Full-Service Hotels.*

Goldstein K., & Vasu Primlani R. (2012), *Current Trends and Opportunities in Hotel Sustainability*, HVS.

Hilton (2013), *Travel with purpose - Corporate Responsibility Report.*

Hyatt (2011), *Corporate Responsibility Report*.

Hotel Energy Solutions (2011), Analysis on energy use by European Hotels: online survey and desk research, *Hotel Energy Solutions.*

Houdré H. (2008), Sustainable Hospitality: Sustainable Development in the Hotel Industry, *Cornell Industry Perspectives.*

InterContinental (2013), *Corportae Responsibility Report*. IHG

Jumeirah Group (2008), *Corporate Responsibility Report*.

Kling M. & Hough I. (2012), Hotel Energy & Carbon Efficiency, *Brighter Planet*.

Langham (2011), Sustainability, the art of living – Sustainability Report*, Langham Hospitality Group*.

Mandarin Oriental (2011), Sustainability Report*, Mandarin Oriental Hotel Group.*

Marriott (2013), Sustainability Report Update - An Update to Marriott's 2011-2012*, Sustainability Report*.

Melia (2011), Sustainability Report 201*, Melia Hotels International*.

Mintel (2004), European Hotel Chain Expansion, Travel & Tourism Analyst, *Mintel International Group.*

Pestana (2011), Planet guest - Pestana Sustainability Report 201, *Pestana Group*

Tomasso L. (2011), Environmental Management of Tourist Growth in China – White Paper Prepared for Wyndham Hotel Group, *Epler Wood International, Harvard University Extension School.*

REST (2011), Renewable Energy and Sustainable Tourism Final Report to the European Commission under the ALTENER Program, *Milton Keynes Energy Agency.*

Rezidor (2012), Sustainability Report*, Rezidor Hotel Group*.

Ricaurte E. (2011), Developing a Sustainability Measurement Framework for Hotels: Toward an Industry-wide Reporting Structure, *Cornell Hospitality Report*.

Shangri-La (2012), Sustainability Report, *Shangri-La Asia Limited.*

Turner J. (2010), Sustainability and Corporate Social Responsibility in Hospitality, *ISIS; Sauder School of Business.*

WTTC (2012), Hotel Carbon Measurement Initiative 1.0. World Travel & Tourism Council*, International Tourism Partnership.*

Zanki V. (2006), Energy Use and Environmental Impact from Hotels on the Adriatic Coast in Croatia – Current Status and Future Possibilities, *Doctoral Thesis KTH Engineering and Management*.