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# IS THE GREEN KEY STANDARD THE GOLDEN KEY FOR SUSTAINABILITY MEASUREMENT IN THE HOSPITALITY SECTOR?

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**ABSTRACT**
The Green Key is an eco-rating program that aims at promoting sustainable business practices in the hospitality sector. The Green Key assesses amongst others the sustainable management of energy, water and waste within hotels and other hospitality firms. The Green Key standard awards points if specific sustainable practices or environmental measures have been implemented, but does however not assess the actual environmental performance of hospitality firms. Therefore, the interesting question arises to what extent the Green Key certification levels relates to the actual environmental performance of hospitality firm This paper focussed on energy usage in hotel, because this is the biggest impact hotels have on the environment and this is the topic that is high on the political agenda because of global warming.

A quantitative study was designed to test the statistical relationship between the energy usage per square meter in Dutch hotels and their level of certification. We conclude that the Green Key certification levels do not relate to actual energy performance of the hotels. The two variables are not correlated. Also the high percentage of gold certified hotels is suggesting that the label shows appliance with the standards, and not highest performance on minimized impact on the environment.

The findings of this pilot will be used to further develop this research to set up a longitudinal research to find the actual impact of eco-labels on actual environmental performance.

*Keywords: Hotels, energy efficiency, eco-labels, certification, sustainability performance*

## 1 INTRODUCTION

Sustainability is an important topic in the hospitality sector; this can be achieved amongst others by implementing certification schemes, such as the Green Key. The Green Key is an eco-rating program that aims at promoting sustainable business practices in the hospitality sector. The Green Key assesses amongst others the sustainable management of energy, water and waste within hotels, restaurants, camp-sites, etc. The Green Key standard awards points if specific sustainable practices or environmental measures have been implemented, but does however not assess the actual environmental performance of hospitality firms. Therefore, the interesting question arises to what extent the eco-rating programme reflects the actual environmental performance of hospitality firm.

The outline of this paper is as follows, the theoretical framework discusses energy usage in hotels as a measure for actual environmental performance of a hotel and the eco certification scheme of Green Key. Next, the methodology is discussed and the results are presented. Finally in the discussion and conclusion further improvement of the measurement of the relationship is discussed and first directions will be proposed to better align the Green Key standard with the actual environmental performance of hotels.

## 2 THEORETICAL FRAMEWORK

In this study we will particularly focus on hotel firms, because of the high participation of hotels in the Green Key label and the relative high environmental impacts of hotels compared to other firms in this sector. This study is going to build upon research by e.g. Grosbois [1], Myung, McClaren [2], Rheede and Blomme [3], Sloan, Legrand [4] about the various sustainability initiatives currently undertaken in the hospitality industry, e.g. eco-labels, sustainability programs and sustainability reporting. This paper will contribute to the debate within the hospitality on which instruments can stimulate the sustainable development in companies effectively.

Black and Crabtree [5] define environmental certification as a ".. voluntary procedure that sets, assesses, monitors, and gives written assurance that a business, product, process, service, or management system conforms to a specific requirement. A marketable logo (sometimes called an eco-label) is awarded to those that conform or meet the criteria, with the standard at least meeting, but generally being above, any regulatory requirements".

This definition also addresses the three objectives of certification: (1) promote the implementation of sustainability practices in the hospitality industry; (2) increase profitability; and (3) provide more accurate information to guests [6]. In the literature the discussion has been on the recognisability labels, and whether it attracted more guests, or guests are willing to pay a premium price for a more sustainable hotels room (e.g. [3, 4]). The question about whether labels reflect the actual impact on the environmental or the social environment has not not discussed so far. Eco-labels that are better capable to represent the real impact of a firm on the environment can potentially lead to a selection by hotel guests of the sustainable hospitality operations, similar to variance and selection in evolutionary processes [7].

In other sectors than the hospitality branch, there is also a rich experience with eco-labelling schemes, eco-rating or environmental certification programmes and benchmarking, see e.g. energy labels for buildings [8], the $CO_2$ performance ladder for the construction sector [9], ISO 14001 certification and energy efficiency benchmarking. Several studies show that impact of these certification schemes is questionable and that labelling does not coincide with the actual performance [8]. This study will also contribute to existing knowledge about the effectiveness of this type of public and private policies and measures.

### 2.1 Energy usage in hotels

Depending on the location, facilities and comfort level of the hotel, energy consumption represents a major part of the utility costs incurred by a hotel. According to Stipanuk [10] energy costs usually amount to four to six percent of the revenue achieved by a hotel and have been driving upwards over the last few years. These costs are amongst the highest non-staff costs applicable for hotel operation [11] . According to Budeanu [12] the average final energy use in a hotel room per guest night ranges from 15 to 90 kWh (comparable with54 to 324 MJ) in North America. Compared to an average

household energy usage per day of 9,5 kWh (comparable with 34 MJ) in the Netherlands[1] [13] the average energy use in a hotel is rather high.

In this research the energy usage is registered as MJ/m2 (serviced space). For the climate region of The Netherlands the following energy performance benchmarks are established for luxury hotels: excellent performance < 1026 MJ/$m^2$; satisfactory between 1026 – 1242 MJ/$m^2$; high between 1242 – 1467 MJ/$m^2$ and excessive: > 1467 MJ/$m^2$ [14].

Webster [15] proposes five initiatives designed to enhance energy efficiency: (1) installation of a computer-controlled air conditioning system, (2) installation of double glazing, (3) installation of an energy efficient kitchen, (4) the purchase of fuel efficient refrigeration, and (5) buying fuel efficient transport [16]. Other factors to be considered are heating, ventilation and air-conditioning systems (HVAC). These above mentioned factors can constitute 20% of the energy consumption applicable for a hotel. Depending on the climate region (the Mediterranean versus Northern Europe), this figure can reach 50% of the energy consumption. It will come as no surprise that this fact leads to the expectation that hospitality industry might focus on energy-efficiency, particularly because actions of this nature may result in money being saved.

In pilot studies [3] it was found that chain hotels in the higher star segments are much more active in their approach to environmental sustainability issues than are privately owned hotels Almost all of the four and five star hotels interviewed pointed out that they were focusing on energy-related measures, as these yielded the greatest cost-savings. However, many also mentioned that saving energy helps the environment as much as it helps reduce costs. Increasing numbers of chain hotels have developed systems to benchmark their own properties and report the results of their sustainability policy in a sustainability report [1].

### 2.2 Eco certification program

The most widely use eco certification program in the Netherlands among hotels is the Green Key. The goals of this program are: '..(1) Environmental and Education for sustainable development of the owner, the staff the stakeholders (suppliers etc) and the client; reduction of the impacts of the facility; (2) Economical management as a reduction of consumption induces a reduction of costs; and (3) Marketing strategy with the promotion of the label and the facilities awarded..' [17]. This is in line with previous mentioned goals of certification systems in general. The certification program works with criteria that are divided into two categories: (1) Imperative to be fulfilled in every Green Key hotel (26 criteria in The Netherlands) and (2) Guideline criteria: designed to be part of the point system. The point system is used to make a distinction between different levels of certification: bronze (17 points), silver (26 points) and gold (33 points) [17]. Concerning energy efficiency the Dutch Green Key certification has 4 imperative criteria and 15 guideline criteria.

The imperative criteria consist of (1) having energy efficient lightning in and around the hotel, (2) inventory of equipment that usage energy or gas (above 150 Watt). In case of replacement, the hotel chooses a energy efficient version. (3)Refrigerators and cold stores are well maintained. (4) prevent lose off heat by outside doors.

The guideline criteria are: daylight systems; light sensors, 100% led; locally controlled climate control systems; climate neutral operation; centralized cooling; heat recovery system; 100% green energy for electricity; green Gas (base on biomass); generates renewable energy; usage of sustainable technics such as Cogeneration; building control system for air and temperature, performs energy scan and takes

[1] Based on an energy usage of an average household of 2,2 person of 3500kWh (12600MJ) per year in the Netherlands

measures or energy label for building. Additional energy reduction via movement detection and timers etc. [18].

The Green Key does not assess the actual environmental performance of hospitality firms. Therefore, the interesting question arises to what extent the eco-rating programme reflects the actual environmental performance of hospitality firms. Since energy is an important factor in this respect, we will focus our research on the actual energy performance only. The energy performance is defined as the total final energy usage in the hotel per $m^2$.

Hypothesis: there is no significant relationship between the energy performance of a hotel and the level of certification in an eco-rating programme for that hotel.

## 3 METHODOLOGY

In this study we used a convenience sample 80 Dutch hotels[2] that provided energy use data from 2012. The hotels were mainly holding a 4 star rating according to the Dutch classification scheme. In table 2 the actual amount of Green Key hotels per certification level for the population and the sample are shown. This data set includes several self reported numbers taken from CSR reports and reporting obligations for the Green key certificate (see table 1). Basic numbers to compare and assess the actual energy performance are the level of Green key certification (bronze, silver or gold), the star rating (according the Dutch classification scheme), the amount of hotel rooms, the total area of hotel rooms (in $m^2$), the total area of conference facilities (in $m^2$), the total final energy usage ($MJ/m^2$: both electricity and gas). Factors that influence the total energy use such as restaurants, bars, pools, gyms, casino's will also be included in the analysis.

Table 1. Descriptive Analysis

| | N | Valid % | Mean | SD |
|---|---|---|---|---|
| GREEN KEY level | | | | |
| Gold | 52 | 75 | | |
| Silver | 16 | 22 | | |
| Bronze | 2 | 3 | | |
| missing | 10 | - | | |
| STAR CLASSIFICATION | | | | |
| 3 *** | 2 | 4 | | |
| 4**** | 74 | 96 | | |
| missing | 1 | - | | |
| YEAR BUILD | 52 | 100 | 1973 | 96 |
| missing | 25 | - | | |
| HOTEL | | | | |
| rooms | 58 | 76 | 143 | 67 |
| total area rooms ($m^2$) | 59 | 76 | 4502 | 2280 |
| conference facilities | 59 | 76 | 12 | 5 |
| total area conf. ($m^2$) | 59 | 76 | 1270 | 867 |
| missing | 19 | - | | |
| FACILITIES | 80 | | | |
| Restaurant | 58 | 100 | | |

[2] Three cases are excluded from the analyses because essential data on total energy use was not correct.

| | | | | | |
|---|---|---|---|---|---|
| | Bar | 58 | 95 | | |
| | Pool | 16 | 27 | | |
| | Gym | 34 | 56 | | |
| | Casino | 4 | 7 | | |
| | Cogeneration (CHP) | 33 | 54 | | |
| | missing | 19 | - | | |
| ENERGY | | | | | |
| | Energy performance (MJ/m$^2$) | 75 | 98 | 2024 | 735 |
| | missing | 2 | - | | |

To test the hypothesis a Spearman's Rank Order correlation was run to determine the relationship between energy performance (MJ/m$^2$) and the level of Green Key certification. IBM SPSS Statistics 19 was used for analyzing the data.

## 4 RESULTS

The sample shows that the majority of hotels, 74%, have achieved the highest level of certification. Within the population of Green Key certified hotels in the Netherlands, this percentage is 65%.

In Netherland there are 3183 hotels [19]. 75% of all rooms are within 3 and 4 star hotels, a total of 905 hotels. 403 hotels are Green Key certified (see Table 2) and a lot of these hotels are 3 or 4 star hotels. We assume that a quarter or one third of all the 3 to 4 star hotels in the Netherlands are certified Green Key hotels.

*Table 2. amount of Green Key certificates Population (2014) versus samples*

| | Population[20] | % | Sample | % |
|---|---|---|---|---|
| GREEN KEY level | 403 | 100 | 80 | 100 |
| Gold | 262 | 65 | 52 | 74 |
| Silver | 117 | 29 | 16 | 23 |
| Bronze | 24 | 5 | 2 | 3 |
| Missing | - | - | 10 | - |

A Spearman's Rank Order correlation was run to determine the relationship between energy performance and the certification level of Green Key of a hotel. The total energy use was not correlated with the level of Green Key certification ($r_s(66) = 0{,}048$, $p = .697$), meaning that the data did not show a higher actual environmental performance in hotels with a higher level of Green Key.

Next to this correlation the variables mentioned in Table 1 where included in a regression analyses where we controlled for size of the hotel (in total area of rooms and conference facilities) and for additional facilities such as restaurants and pools. This did not provide us with additional insights on the correlation between energy performance and level of certification.

## 5 DISCUSSION AND CONCLUSION

The authors assume a sort of normal distribution in the level of sustainable performance among businesses. The fact that 65% of all hotels has the gold certificate, suggests that the label shows conformation to standards, and not highest performance on minimized impacts on the environment. In addition the sample has also some limitations. First of all the amount of

gold certified hotels is over represented by 9% in the sample (see Table 2). Another issue is the little amount of silver and bronze Green Key hotels. The relative small size of the sample makes is difficult to find a significant relationship if sub groups are small.

Second, energy performance was calculated per $m^2$. Data on the energy use per guest was not available. This is an indicator the Green Key uses and it is especially important to control the effect of occupancy on the energy performance in a hotel. Longitudinal data on the energy usage before (zero measurement) and since joining the label – corrected for degree days [21] – would give more insights in the actual effect of the Green Key certification on actual energy performance.

The conclusion of the research however stays intact: the eco-rating programme does not reflect the actual environmental performance of a hospitality firm: there is not a significant relationship between the energy performance of hotels and the level of certification in an eco-rating programme.

Based on the result it is too early to make judgement on the certification system of Green Key. We suggest the following routes for continuation of the research. We will use the findings of this pilot to collect a bigger sample – with additional variables to find stronger evidence whether the certification system of the Green Key represents the actual impact on the environment. It would also be interesting to evaluate the Green Key's effect from a different perspective by studying the type and impact of implemented energy efficiency measures.

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