

# Retrofitting hotels: evidence from the Protea Hospitality Group of hotels within Gauteng, South Africa

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## Abstract

Over the past decade the environmental responsibilities, practices, policies and performance of hotels have garnered an increasing international scholarship by tourism and hospitality researchers. The imperative for environmental retrofitting of hotels arises from the existence of resource-intensive and frequently inefficient systems and operational routines in the hotel sector which can result in negative environmental impacts. The present article analyses one dimension of the relationship between hotels and sustainable development in South Africa. Specific attention is on issues of the environmental retrofitting in hotels. The empirical focus is upon the operations of a ten hotels in Gauteng, South Africa's economic heartland, which are part of the Protea Hospitality Group. It is revealed that the nature of retrofitting initiatives at the hotels differed with the most common initiatives being the introduction of LED lighting and recycling initiatives. The leading reasons for introducing environmentally friendly measures were to reduce the hotel's carbon footprint, to reduce costs and to enhance brand image. These findings align with those of other investigations which have highlighted profit considerations linked to enhanced competitiveness as the most significant drivers for the greening of hotels.

**Keywords:** Retrofitting; built environment; hotels; Protea; greening; South Africa

## Introduction

Hotels constitute one of the anchors of the global tourism economy. According to Gössling (2002) it is estimated that worldwide hotel facilities consume about 100 Twh of energy and 450-700 million m<sup>3</sup> of water per annum as well as generate millions of tons of waste. Bohdanowicz (2009: 102) stresses that resource-intensive and frequently inefficient systems and operational routines in the hotel sector can result in considerable environmental impacts. Accordingly, given the increasing international debates surrounding tourism and climate change and of the need for adaptation measures to stem global warming (Gössling, Peeters & Scott, 2008; Hoogendoorn & Fitchett, 2016), it is not surprising that academic attention has turned to scrutinize issues around the relationships between the hotel sector and climate change (Millar & Baloglu, 2011; Walmsley, 2011).

Over the past decade or so the environmental responsibilities, practices, policies and performance of hotels have garnered an increasing scholarship by tourism and hospitality researchers. The leading edge of international debates is headed by the rich (mainly) European-based works of Bohdanowicz and her colleagues (Bohdanowicz, 2005; Bohdanowicz, Simanic & Martinac, 2005; Bohdanowicz, 2006, 2007; Bohdanowicz, & Martinac, 2007; Bohdanowicz & Zientara, 2008; Bohdanowicz, 2009; Bohdanowicz, Zientara & Novotna, 2011) as well as the recent North American contributions by Zhang and co-workers (Zhang, Joglekar & Verma, 2012; Zhang, Joglekar, Heineke & Verma, 2014). Although the bulk of scholarship around hotels and sustainable development inevitably remains focused on the global North it must be acknowledged that a number of useful

contributions have appeared on the environmental performance and practices of the hotel industry in parts of Asia and Africa (see Le, Hollenhorst, Harris, McLaughlin, & Shook, 2006; Mensah, 2006; Kasim, 2007; Mensah, 2007; Kasim, 2009; Ball & Taleb, 2011; El Dief & Font, 2012; Rogerson & Sims, 2012; Mensah & Blankson, 2013; Sucheran & Bob, 2015).

Overall, it has been argued that the hospitality industry, specifically hotels, needs to increase their engagement with issues around climate change mitigation and adaptation (Walmsley, 2011). This said, critical scholars have suggested from the experience of the global North that despite its significance the question of environmental stewardship is not always a major priority for the hotel sector (Bohdanowicz, 2005, 2006). Walmsley (2011: 79) avers that as compared to other tourism businesses the adaptive capacity of hotels is relatively weak not least because of the fact the “hotel cannot simply move from one location to another” unlike certain other tourism businesses. Nevertheless, there is a growing recognition that environmental proactivity can contribute to enhancing competitive advantage in the hotel sector in terms of issues of both cost and differentiation (Bohdanowicz, 2009; Lopez-Gamero, Pertusa-Ortega, Molina-Azorin, Tar-Guilio & Pereira-Moliner, 2016). Environmental strategies thus can be a source of competitive advantage for hotels (Claver-Cortés, Molina-Azorin, Pereira-Moliner & López-Gamero. 2007; Walmsley, 2011). Questions remain, however, as to the actual extent to which the hotel industry will face the future challenges of sustainable development especially in light of the industry’s current business models as well as its managers’ willingness and capabilities in respect of climate change adaptation and environmental practices (Melissen, Cavagnaro, Damen & Düweke, 2016).

It is against this backdrop that the present article examines a dimension of the relationship between hotels and sustainable development in South Africa. More specifically, our attention is on issues of retrofitting which relates to the addition of new technologies to old systems. Environmental retrofitting in hotels, the focus of this research, refers to the adding of new technology to already existing buildings in the form of the implementation of environmentally friendly measures. Retrofitting is an attempt at rectifying environmental degradation and improving upon the existence of resource intensive and inefficient systems which inevitably exert negative environmental consequences. The empirical focus of the investigation is upon the operations of a set of hotels in Gauteng, South Africa’s economic heartland, which are part of the Protea Hospitality Group. The analysis of retrofitting in these hotels is situated against a brief background review of hotel greening and retrofitting scholarship.

### **Green hotels and retrofitting debates**

The term ‘green buildings’ refers to properties which are energy efficient, resource efficient as well as environmentally responsible. (Green Building Council South Africa (GBCSA), 2014; Perez, Coma, Matorell & Cabeza, 2014). Such buildings integrate design practices, construction practices, and operational practices in order to ensure the significant reduction or elimination of adverse environmental effects, as well as the effects they exert on the human population (GBCSA, 2014). Green buildings allow for efficient resource usage, and thereby address the issue of climate change (Wu & Teng, 2011; GBCSA, 2014; Perez *et al.*, 2014). The need for retrofitting of commercial properties arises as a result of the large amounts of resource efficiencies and waste being produced by the built environment (Henderson, 2012). Retrofitting is an attempt at rectifying this issue by producing sustainable buildings and in turn conserving the natural environment and facilitating a balance between the environment and development (Henderson, 2012). In turn, this is associated with a contribution towards achieving sustainable development. Newly built green buildings as well as retrofitted buildings reduce their carbon footprints by implementing environmentally friendly measures such as light-emitting diode (LED) lighting, double glazed windows, solar geysers, water storage tanks, recycling, occupancy sensors, half-flush/ full-flush systems,

waterless urinals, and locally sourced products amongst others (Wu & Teng, 2011; Rogerson & Sims, 2012).

In support of the greening of commercial property there has been an increase in institutions providing sustainable building initiatives, policies and green accrediting associations. Certification schemes and Green Building Rating Tools (GBRT) are important aspects of environmental management (Millar & Baloglu, 2011; Rogerson & Sims, 2012; Chen, Yang & Lu., 2015). One of the initial GBRT was the Building Research Establishment Environmental Assessment Method (BREEAM), established in 1993, with the aim of reducing the consumption of natural resources within the built environment (Asdrubali, Baldinelli, Bianchi & Sambuco, 2015; Chen *et al.*, 2015). In terms of policy, the Netherlands provide best practice with regards to sustainable buildings and energy policies and is at the frontier of the development and implementation of energy efficient policies, encouraging the integration of financial, legal, and environmental aspects within the built environment, not by changing already existing technologies, but by refining the content of the environment (Keivani, Tah, Kurul & Abanda, 2010). The United States Green Building Council (USGBC) has been an integral part of a number of green building developments through which they realized the need and urgency for a green building measurement system (USGBC, 2010). This led to the establishment of the Leadership in Energy and Environmental Design (LEED) in 2000, which is a building certification qualification tool (USGBC, 2010). The Green Building Council of South Africa (GBCSA) developed the Green Star SA rating tools (GBCSA, 2014). The main aims of the Green Star SA rating tools include establishing common standards for the measurement of green buildings, to provide awareness of the benefits associated with green buildings, and to minimize development related environmental impacts, amongst others (GBCSA, 2014). Additional initiatives encompass those of the Energy Performance of Buildings European Directive (EPBD) which was enforced by the European Union with one of their goals being sustainable building practices and the United Nations Environmental Programme's (UNEP) Sustainable Building and Construction Initiative which is targeted to produce sustainable buildings (Keivani *et al.*, 2010).

As a subset of the category of green buildings, green hotels are eco-friendly accommodation properties which implement programmes designed to save energy and water, as well as reduce landfill waste by recycling. According to Wu and Teng (2011: 7579) "green hotels may be distinguished from ordinary hotels in that they aim to use products and services that minimize the consumption of water and energy, and reduce the output of solid waste, in order to protect the environment from the further depletion of its natural resources" (Wu and Teng 2011: 7579). It has been argued that the emergence of 'green hotels' is "one of the most important innovations in the tourism sector" (Wu and Teng 2011: 7579). Internationally, the phenomenon of green hotels has attracted critical debate. In particular, Pizam (2009) questions whether the movement towards green hotels is a temporary fashion, a marketing ploy, or a new growing trend that will ultimately become a permanent feature of the hotel sector. Arguably, many hotels engage in the practice of 'green washing' only for marketing purposes and introduce simple practices such as changing bed linen less frequently or eliminate disposable toiletry in guest rooms such that greening is a marketing ploy "without really being green" (Rahman, Reynolds & Svaren, 2012: 721). This said, it is countered that whilst the greening of hotels might be a marketing ploy to attract environmentally responsible customers, it is considered that there is a growing number of hotels that are "sincerely instituting programs that save water and energy, reduce solid waste, use resources economically, protect the planets ecosystem, and provide products and services that do no harm to human health" (Pizam, 2009: 1).

It is argued that the extent of retrofitting of properties within the different sub-sectors of the built environment will exhibit considerable variation (Santamouris, Balaras, Dascalaki, Argiriou & Galia, 1996; Thovhakale, 2012). Within the tourism sector, the main features of

accommodation services are that are located in a convenient area for visitors as well as comprising high standards of efficiency and comfort for visitors (George, 2008). As the hotel sector cannot compromise the quality of experience of visitors' stay it is argued that the amount of retrofitting of hotels may not be as great as for other commercial buildings, such as office parks and shopping centers (Rogerson & Sims, 2012; Thovhakale, 2012). With variations in terms of resource consumption levels within the hotel sector as a result of the different hotel sizes, stars, class, as well as target groups (Santamouris *et al.*, 1996) it is acknowledged that there is no generic form of a retrofitted hotel and that there are many different levels of retrofitting for green hotels (Henderson, 2012). As argued by Kang, Stein, Heo and Lee (2012) alongside the growth of consumer willingness to pay for green initiatives in the hotel industry retrofitting within the hotel sector is becoming more in evidence as a reflection of environmental awareness within the hotel sector. One high-profile international example of a retrofitted hotel in terms of energy is The InterContinental Hotel at Hyde Park Corner in London (Han, Hsu, Lee & Sheu, 2011; Rahman *et al.*, 2012). Greening measures undertaken by this hotel include the switch to lighting which is energy efficient, the implementation of energy management, as well as holding environmental awareness campaigns in terms of staff training sessions (Singh, Cranage & Lee, 2014). These measures, in addition to others, reduced the hotel's annual consumption of energy from 870 kWh/m<sup>2</sup> in 1980 to 575kWh/m<sup>2</sup> by 1992, a 34% saving (Rahman *et al.*, 2012). A best practice case of a retrofitted hotel in terms of waste generation and recycling is The Hyatt Regency in Chicago which recycles newspaper, cardboard, magazines, glass, and cans (Enz & Siguaw, 2003; Han *et al.*, 2011) resulting in a reduction of their landfill refuse by one million pounds per annum (Enz & Siguaw, 2003).

Overall, fierce controversies surround the reasons for the greening of the hotel sector. Several considerations can influence the decisions by hotels to choose to go green, including through retrofitting. The three major drivers are those of competitiveness, legitimation and ecological responsibility (Rahman *et al.*, 2012; Rogerson & Sims, 2012). The issue of legitimation arises under conditions of governments introducing certain regulatory requirements for hotel compliance in relation to environmental practices. The factor of ecological responsibility suggests businesses opt to go green because it is simply "the right thing to do" (Pizam, 2009: 1). This said, it is widely held that for large hotel chains the activity of green is inseparable from improving brand image and of marketing to clients (Walmsley, 2011; Rogerson & Sims, 2012). Above all Walmsley (2011: 80) stresses that "improving a businesses' environmental performance is not necessarily a purely selfless act" as it can contribute both to the competitiveness of particular hotels and their brands and have positive impacts for the destination as a whole (Claver-Cortés *et al.*, 2007).

In South Africa, there are no environmental laws and legislature stating that it is mandatory for hotels to undergo greening and retrofitting in relation to the implementation of environmentally friendly measures. In this respect it has been argued by Rogerson and Sims (2012) that national government is only weakly promoting sustainability within this sector, which is part of the reason for South Africa lagging by international comparisons in terms of the greening of the hotel sector. This said initiatives are on the rise. It is argued that Africa's greenest hotel is "Hotel Verde" in Cape Town, South Africa (Jordan, 2014; Dall, 2014; Sucheran & Bob, 2015) which meets environmental standards beyond that of any other green hotel on the African continent (Dall, 2014). Eco-friendly measures implemented by Hotel Verde include wind turbines, photovoltaic installation, as well as geothermal heat pumps, amongst many other measures (Dall, 2014; Jordan, 2014; Sucheran & Bob, 2015) and with 40% of the hotel's electricity being self-generated (Jordan, 2014; Dall, 2014). This award-winning hotel is a green build rather than a retrofit (Jordan, 2014; Dall, 2014; Sucheran & Bob, 2015).

The challenge of retrofitting in South Africa is one that faces the country's major hotel chains which are responsible for the majority of the country's hotel products. Within the past decade, one of the country's largest hotel chains, the Protea Hospitality Group (PHG) of hotels has begun to retrofit its portfolio of hotels by implementing energy and water saving measures as well as recycling initiatives. The PHG of hotels was founded in 1984 as a South African hotel brand (Marriott International Inc., 2013). From its South African base Protea has expanded its corporate footprint across the African continent to include countries such as Nigeria, Zimbabwe, Uganda, Namibia, Malawi, Zambia, and Tanzania (Reinstein, 2013; Marriott International Inc., 2013; Protea Hotels, 2015). Protea manages, leases, and franchises hotels across the group and is made up of three different brands; namely the Protea brand, the Fire&Ice! brand, as well as the African Pride brand (Marriott International Inc., 2013). During 2014 the group was taken over by multinational hotel giants, the Marriott International group (Reinstein, 2013; Marriott International Inc., 2014).

### Study and methodology

The study group for this research are ten Protea Hotels situated within Gauteng which recently began to implement measures for environmental retrofitting in order to reduce their environmental footprint. Internet mediated research allowed the preparation of a list of retrofitted PHG hotels from which the ten hotels were selected for detailed investigation. The study hotels include Protea Hotel African Pride Melrose Arch, Protea Hotel Fire & Ice! Melrose Arch, Protea Hotel Wanderers, Protea Hotel Parktonian (Braamfontein), Protea Hotel O.R Tambo Airport, Protea Hotel Balalaika (Sandton), Protea Hotel Midrand, Protea Hotel Centurion, Protea Hotel Roodepoort, and Protea Hotel Hatfield. In total these ten hotels make up almost two-thirds of the total of Protea Hotels in the Gauteng province.

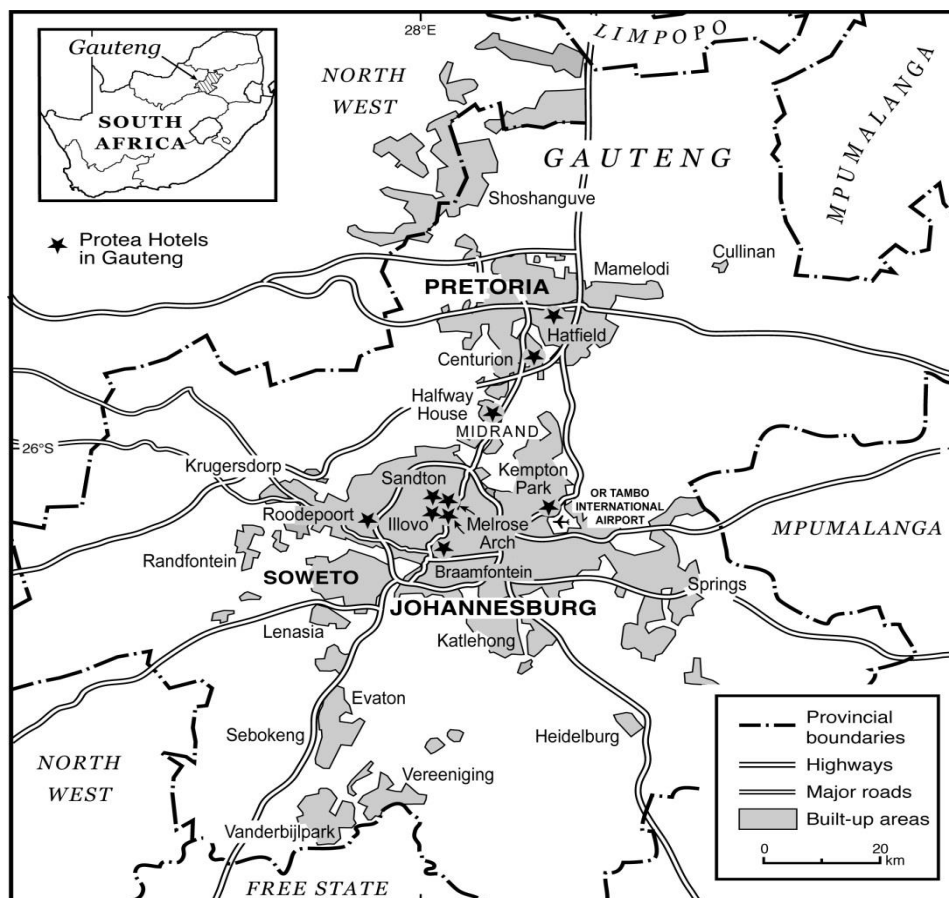


Figure 1: Location of Hotels in the Study  
 Source: Authors

**Table 1: Descriptive overview of the study hotels**

Name of Hotel	Star Grading	Area	Number of rooms	Number of floors
Protea Hotel African Pride Melrose Arch	5 star	Melrose Arch	118	4
Protea Hotel Fire & Ice! Melrose Arch	4 star	Melrose Arch	197	7
Protea Hotel Wanderers	4 star	Illovo	229	7
Protea Hotel Parktonian All-suite	4 star	Braamfontein	300	23
Protea Hotel O.R Tambo Airport	4 star	Kempton Park	213	5
Protea Hotel Balalaika	4 star	Sandton	330	3
Protea Hotel Midrand	4 star	Midrand	151	2
Protea Hotel Centurion	4 star	Centurion	177	5
Protea Hotel Roodepoort	3 star	Constantia Kloof	79	5
Protea Hotel Manor	3 star	Hatfield	88	3

Figure 1 maps the location of the study hotels and Table 1 gives a descriptive overview of the ten hotel properties. More specifically, Table 1 furnishes an overview of each study hotel including the star grading, suburb, the number of rooms, as well as the number of floors. This information was obtained via internet mediated research. In terms of the investigation, a range of approaches were deployed which resulted in the collection of internet mediated findings as well as quantitative and qualitative data. During 2014, preliminary visits to the study hotels were conducted in order to obtain information to confirm the study. Initially, hotels were contacted telephonically, the study was explained and meetings were requested. The collection of qualitative and quantitative data was obtained for this study via semi-structured interviews with hotel personnel. The majority of interviews were undertaken either with general managers (GM) and/ or maintenance managers with photographic documentation obtained as evidence of retrofitting. The choice of GMs and maintenance managers for interview was based on their experience related to the issue of retrofitting. All interviews were conducted on site at the respective study hotels. An interview schedule made up of 42 open-ended qualitative and quantitative questions was drawn up for completion at all hotels under study. Ethical issues were considered in the construction of the questionnaire which includes being open-minded, non-judgmental, recognising limitations of sensitive data as well as ensuring confidentiality and anonymity (Longhurst, 2010).

During 2015 follow-up visits to the ten study hotels were made in order to complete the questionnaires. Continuous communication via email as well as phone-calls with respective personnel from each hotel under study provided up-to-date information. In terms of quantitative data collection, the energy and water meters and bills, as well as information on what eco-friendly measures have been implemented within each study hotel were identified. This has been indexed by indicators such as cooling systems, insulation, air tightness, solar and photovoltaic panels, insulated hot water systems, lighting, waste management and recycling, hazardous material, ventilation, glare control (glazing), water consumption and conservation, water pressure, and occupancy sensors, amongst other indicators. One problem arose in relation to information disclosure as certain personnel were unwilling to provide strategically sensitive information about resource consumption and expenditure. For this study the amounts of energy and water and money being saved were examined by means of the energy and water meter readings and bills as well as through interview responses. The resultant outcomes of implementing retrofitting measures (both positive and negative) on the environment were identified for each study hotel.

## Findings

In this section the major results are presented from the investigation (Ismail, 2016). Analysis of findings include the nature of retrofitting undertaken at each hotel, cost and benefits associated with retrofitting including estimated period to recoup costs, and motivations for retrofitting.

**Table 2: Summary of green measures implemented through retrofitting at the study hotels**

Hotel	Green Measures Through Retrofitting
Protea Hotel African Pride Melrose Arch	LED lighting; dimming lights; the Vivreau bottled water system which makes use of reusable glass bottles and in turn not only reduces the amount of plastic bottles being used and discarded; gas boilers; LCD television sets; laundry notices whereby guests are given the choice to reuse their towels and linen; the half-flush/ full-flush system; double glazed windows; recycling items such as paper, batteries, fluorescent tubes, glass and plastic; reducing the use of paper products.
Protea Hotel Fire & Ice! Melrose Arch	LED lighting; sensor lighting in the parkade area; double glazed windows; insulated water pipes; insulated boilers; insulated walling; low flow taps and showerheads with reducing valves; sensor taps; the half-flush/ full-flush system; extractor fans; individual air-conditioning units; environmentally friendly detergents and paints; locally sourced food; a herb garden; the Vivreau bottled water system; laundry notices; recycling.
Protea Hotel Wanderers	LED lighting; the heat pump system; double glazed windows; insulated water tanks; the half-flush/ full-flush system; the waterless urinary system; in-house washing machines; a central air-conditioning system which operates according to a timer; recycling items such as card boxes, paper, plastic, batteries, glass, and light bulbs.
Protea Hotel Parktonian	LED lighting; medium flow taps and showerheads; the half-flush/ full-flush system; waterless urinals; individual air-conditioning units; environmentally friendly detergents and paints; recycling; the in-house reuse of paper; sensor lighting in the basement parking area; local sourcing of food; the Vivreau bottled water system.
Protea Hotel O.R Tambo Airport	LED lighting; double glazed windows; insulated boilers; circulation pumps; insulated tanks; day-night light switches; solar geysers; a water storage tank which stores water from a borehole pump for irrigation; environmentally friendly detergents and paint; recycling items such as paper, cardboard, bottles, plastic, and batteries; heat exchangers; sensor taps; showerheads and taps with reducers; the half-flush/ full-flush system; individual air-conditioning units; the use of electronic newspaper and mail; occupancy sensors; reminders for guests to switch off lights and other appliances when not in use; the Vivreau bottled water system; local sourcing of food.
Protea Hotel Balalaika	LED lighting; chlorofluorocarbon free fridges; the switch to gas; natural compost such as tree cuttings and leaves which does not pollute the soil as well as the underground water; underground water which is stored in a water tank; energy saving heat pumps; individual air-conditioning units; in-house washing machines; an environmentally friendly fireplace which emits less smoke; recycling items such as cardboard, paper, bottles, plastic, and used cooking oil; laundry notices; sensor taps; half-flush/ full-flush system; air-bricks; solar shading; ceiling fans in select areas; environmentally friendly detergents and paints; reminders for guests to switch off electricity when not in use; sensor and timer garden lights and heaters; local sourcing of food.
Protea Hotel Midrand	LED lighting; a timer system on lighting; double glazed windows; thermal breaks; insulated boilers; the half-flush/ full-flush system; laundry notices; locally sourced food; the Vivreau bottled water system; individual air-conditioning units; environmentally friendly detergents and paints; recycling; the reuse of paper for internal purposes; a herb garden; closing off a wing of the hotel during off-peak seasons.
Protea Hotel Centurion	LED lighting; insulated water tanks; insulated boilers; the half-flush/ full-flush system; environmentally friendly detergents and paints; recycling; individual air-conditioning units; occupancy sensors; reminders are also available in each room

	for guests to switch off all electrical appliances when not in use, together with a laundry notice; the Vivreau bottled water system; local sourcing of food.
Protea Hotel Roodepoort	LED lighting; sensor urinals; the half-flush/ full-flush system; laundry notices; individual air-conditioning units; environmentally friendly detergents and paints; in-house washing machines; recycling; local sourcing of food.
Protea Hotel Manor	LED lighting; a timer on the lighting; occupancy sensors; double glazed windows; individual air-conditioning units; insulated water pipes and tanks; the half-flush/ full-flush system; air vents; environmentally friendly detergents; recycling items such as bottles, paper, and used cooking oil; a water tank which stores borehole water; waterless urinals; laundry notices; the Vivreau bottled water system; local sourcing of food.

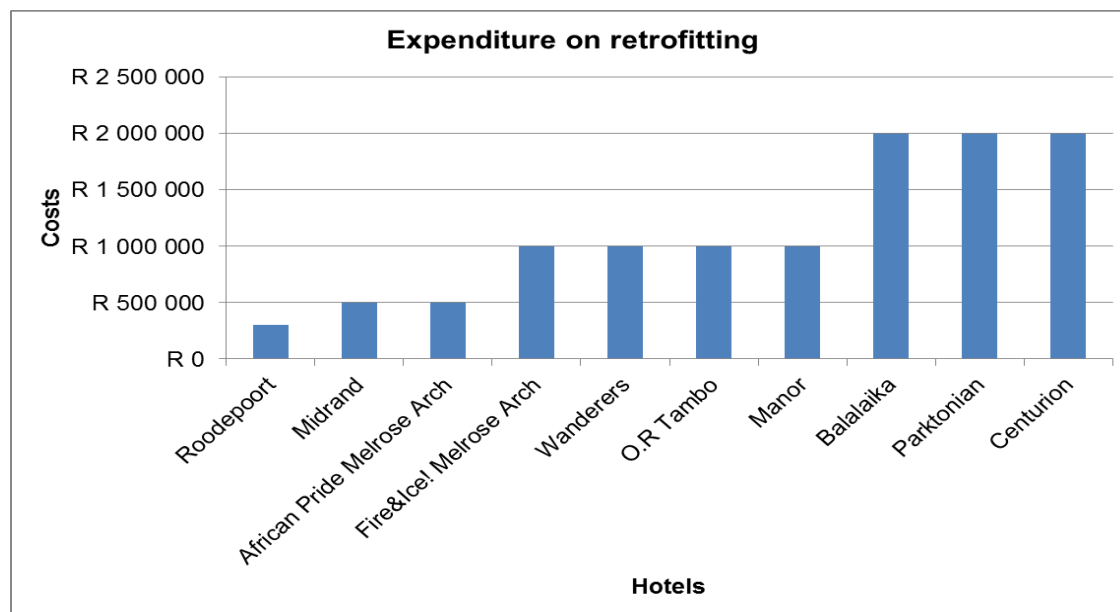
**Source: Authors**

Table 2 provides a summary of retrofitting measures pursued at the ten study hotels at the time of the research (2014/early 2015). It is evident that the nature of retrofitting initiatives at the hotels differed. Among the most common initiatives was the introduction of LED lighting which occurs at all of the study hotels. It was made clear in interviews that the switch over to use of LED lighting was the starting point of retrofitting across the PHG. As a result of the longer guarantee of these bulbs all these hotels made this change albeit initial problems were experienced at certain hotels such as Protea Hotel Wanderers where bulbs blew as a result of the generator kicking-in when power outages occurred. Another environmentally friendly measure implemented at all hotels was recycling. Nevertheless, the extent of recycling varied markedly across the study hotels. For example, the Protea Hotel Manor currently lacks sufficient space for the numerous bins and are looking at possible solutions to this problem. By contrast, at Protea Hotel Centurion recycling initiatives are well advanced and the hotel has one permanent employee specifically taking care of the recycling area.

The half-flush/ full-flush toilet system is used at nine of the study hotels. Interviewees stressed that this measure results in considerable cost savings of water usage. The Protea Hotel Parktonian, Protea Hotel Wanderers, and Protea Hotel Manor each have waterless urinals which allows for further savings on water usage. Another water conservation measure is the introduction of the Vivreau bottled water system which uses reusable glass bottles. This system was introduced at eight of the hotels and is a standard measure now of the PHG. The Protea Hotel Roodepoort stated, however, that the introduction of this system was not feasible there because of the small size of the hotel. Seven of the ten hotels under investigation indicated a preference for green suppliers and in two cases green products were made available to guests on request. In terms of newspapers, three of the hotels now provide electronic newspapers to guests via free wifi and the remaining seven study hotels provide hard copy newspapers on a daily basis. According to Protea Hotel Parktonian, it is a Protea standard to provide hard copy newspapers to guests on a daily basis. The three study hotels providing electronic newspapers have adopted alternative measures to further reduce their carbon footprint. This illustrates the variety of impacts and differences of local managers. It was observed that four of the hotels shut down certain sections of the hotel property during their off-peak seasons because of the low occupancy rates. This close down in turn allows for the occurrence of maintenance. For example, only one section of Protea Hotel Parktonian is available during the December period as this hotel is primarily geared to use by local business tourists. It was observed that only two of the study hotels' parkade areas have fitted occupancy sensors which includes the undercover parking at Protea Hotel Fire & Ice Melrose Arch. The stated reasons for the majority of hotels not having sensors in their parking areas is that they are open parking which allows for direct sunlight during the day. In terms of specific innovations to the PHG the Protea Hotel Balalaika was distinguished as the only hotel which had introduced an eco-friendly fire place. In terms of future plans most of the studied hotels had completed the planned retrofits with no further measures likely to be implemented in immediate years. Two of the hotels, however, were in the process of switching to heat pumps, one was seeking further improvement on its



recycling initiatives and another was examining the introduction of solar energy. Finally, at one hotel, the introduction of a worm farm to improve recycling was under consideration but not currently viable on financial grounds.



**Figure 2: Expenditure on retrofitting (Source: Authors).**

Based upon responses from the hotel interviewees Table 2 offers a summary of the expenditures of each hotel on retrofitting measures. Considerable differentiation is observed across the study hotels. The differences are accountable in relation mainly to the size of hotels, the age of the property that is undergoing retrofitting, and the extent of retrofitting measures that were undertaken. As is evidenced on Figure 2 the expenditure per hotel on the implementation of retrofitting measures across the ten study hotels ranges from R300 000 to R2 000 000 in total. The small 3 star Protea Hotel Roodepoort spent the lowest amount of approximately R300 000 on the measures implemented at their hotel which include the switch to LED lighting, the half-flush/ full-flush system as well as the laundry notices. The more extensive retrofitting undertaken at the 4 star Protea Hotel Fire & Ice! Melrose Arch cost an estimated R1 000 000 variously on the switch to LED lighting, the half-flush/ full-flush system, laundry notices, a herb garden as well as the Vivreau bottle water system. The most costly retrofitting measures at the time of the study were at the 4 star Protea Hotel Balalaika in Sandton which had spent approximately R2 000 000 on a suite of environmentally friendly measures which are presented on Table 2.

The interviewees reflected on the period for cost recoupment linked to the expenditures associated with retrofitting measures. In most cases the anticipated period was at least five years and, in the cases of several hotels which had undertaken the largest extent of retrofitting of the anticipated period, was between 10 to 12 years. For all hotels a period of trial and error was recognised in the introduction of certain green measures. At the Protea Hotel Balalaika no problems had been experienced which was explained on the grounds of conducting prior research before implementation of green initiatives. At Protea Hotel Midrand a trial period lasted for 3 months as the hotel had to switch from a day-night sensor to a timer because of the sensitivity of LED lights many of which blew out at the beginning of their usage. In terms of the benefits of retrofitting the majority of the hotel respondents stated that retrofitting was viewed as a long-term investment for these hotels. Of note is that for half of the studies hotels the implementation of green measures was now part of their hotel marketing.

The motivations for retrofitting were explored in the interviews. Most hotels responded with a number of different drivers for change. The three most common responses were to reduce the hotel's carbon footprint, to reduce costs and to enhance brand image. These findings align with those of other investigations which have highlighted profit considerations linked to enhanced competitiveness as the most significant drivers for the greening of hotels (Rahman *et al.*, 2012; Rogerson & Sims, 2012). The increase in tourist consumer awareness of environmental issues which can impact decision-making for choice of hotels clearly underpins the greening movement across the Protea Hospitality Group of Hotels in Gauteng. It was significant that of an array of factors that legitimisation was ranked by interviewees as the least significant motivating factor for retrofitting linked to green initiatives. This low ranking is a reflection of the current absence of South African government legislation about greening in relation to the country's hotel sector.

## Conclusion

In a recent overview paper Hoogendoorn and Fitchett (2016) draw attention to the critical significance for the future of African tourism of greater awareness of and research contributions around the intersection of tourism and climate change. One element of the research agenda is the greening of the continent's hotels, including in many cases through measures for retrofitting. Arguably, tourism and hospitality scholars engaged in African research must strengthen the existing knowledge base around the nexus of hotels and the development of green properties.

Although contributions towards greening of the hotel sector in Africa must be made by the large numbers of small independent hotels, the major initiatives and leadership for greening must come from the large hotel chain groups which dominate the commanding heights of the African hotel landscape. One of those large chains is the Protea Hospitality Group which has been absorbed recently into the Marriott group of hotels. Our research has expanded the limited existing literature around greening and hotels in South Africa and shows the variability in retrofitting which occurs amongst hotels within the same hotel chain. This result points to the need for further insight into the relationships between hotel chain corporate strategy and implementation measures enacted at the level of individual hotels. Further analysis is merited also of greening initiatives in the Marriott group of hotels as well as those pursued (or not undertaken) in South Africa's other large leading chain hotels such as Tsogo Sun and City Lodge.

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