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TOWARDS THE BUSINESS CASE FOR SUSTAINABLE HOTELS IN ASIA

Motivations and impacts of sustainable hotel development in Asia
A guideline on smart, practical and cost-effective development and operating practices

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TOWARDS THE BUSINESS CASE FOR SUSTAINABLE HOTELS IN ASIA

Introduction

This study capitalises on three years of submissions for the HICAP Sustainable Hotel Awards. The objectives of the sustainable hotel awards are to recognise the range of sustainability good practices emerging in the hotel sector in Asia, and understand the link between these practices and business / financial performance. The case studies making up the bulk of this report have been drawn from a range of operations - large and small, city and resort, mainstream and niche from across the region (see Map) – and provide an insight into the motivation for, and impact of more sustainable practices. Our intention in drawing these case studies together is to provide examples of what can be achieved, to encourage and inspire others, and set a benchmark for further reviews.

Hotels in this review were selected on the basis that they had invested time and resources in developing a “sustainability” offer generating business benefits. We recognise some of these benefits are difficult to quantify (particularly social and biodiversity focused activities) but were nonetheless seen as part of the value proposition of each case study.

Sustainability means many things to many people, complicating the challenge we set ourselves. Over recent years there has inevitably been a focus on financial sustainability – as the sector struggles with the implications of a global recession. Our definition of sustainability encompasses financial performance (without net profit nothing much is going to last), but also looks specifically at the environmental and social performance of these operations.

In relation to environmental and social performance, we looked at the ways hotels go beyond the requirements set by local and national governments, and in particular the ways in which hotels address social and environmental externalities – those aspects of a business’ operation which aren’t generally captured in annual accounts (such as training, community outreach and protection of biodiversity), but which seem to be at the cutting edge of many sustainability commitments and activities.

Looking to the future it seems likely today’s externalities will increasingly become aspects of a more regulated business environment for hotels (for example commitments to a low carbon economy will inevitably result in greater regulation at some stage), and thus the good practices demonstrated in this report, may become the business norms of the near future. As such, we hope this report will serve as guidance, and help to inform the wider hotel sector in the region.

We are grateful to the operators, owners and staff who gave freely of their time and views and a list of acknowledgements is provided. We are also grateful to Horwath HTL for providing consultancy services and resources to undertake the research, and to WWF for the provision of a travel grant allowing the researcher to visit all properties in this report.

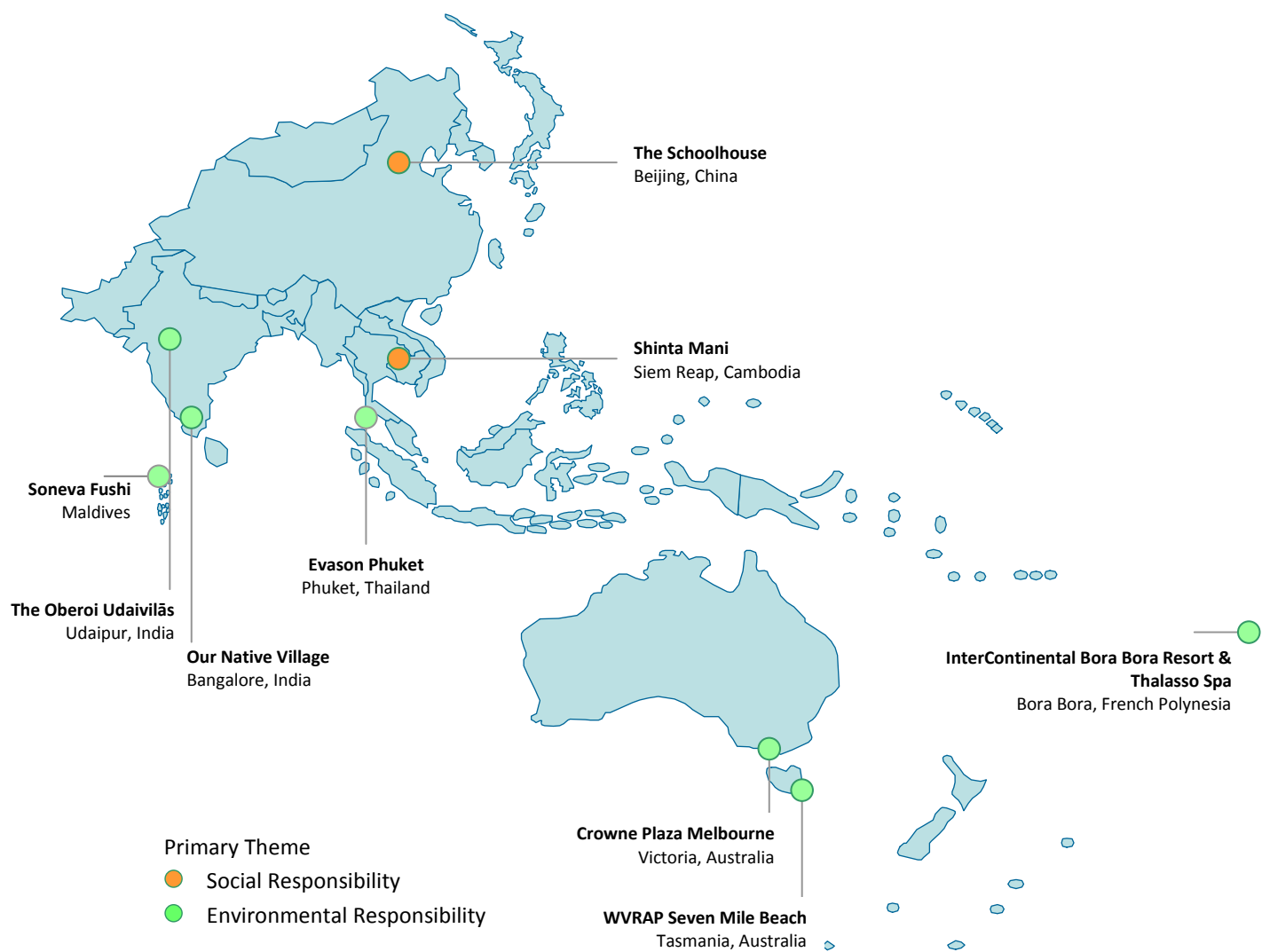
Sincerely,



Mark Eckstein
Managing Director
International Finance
WWF-US



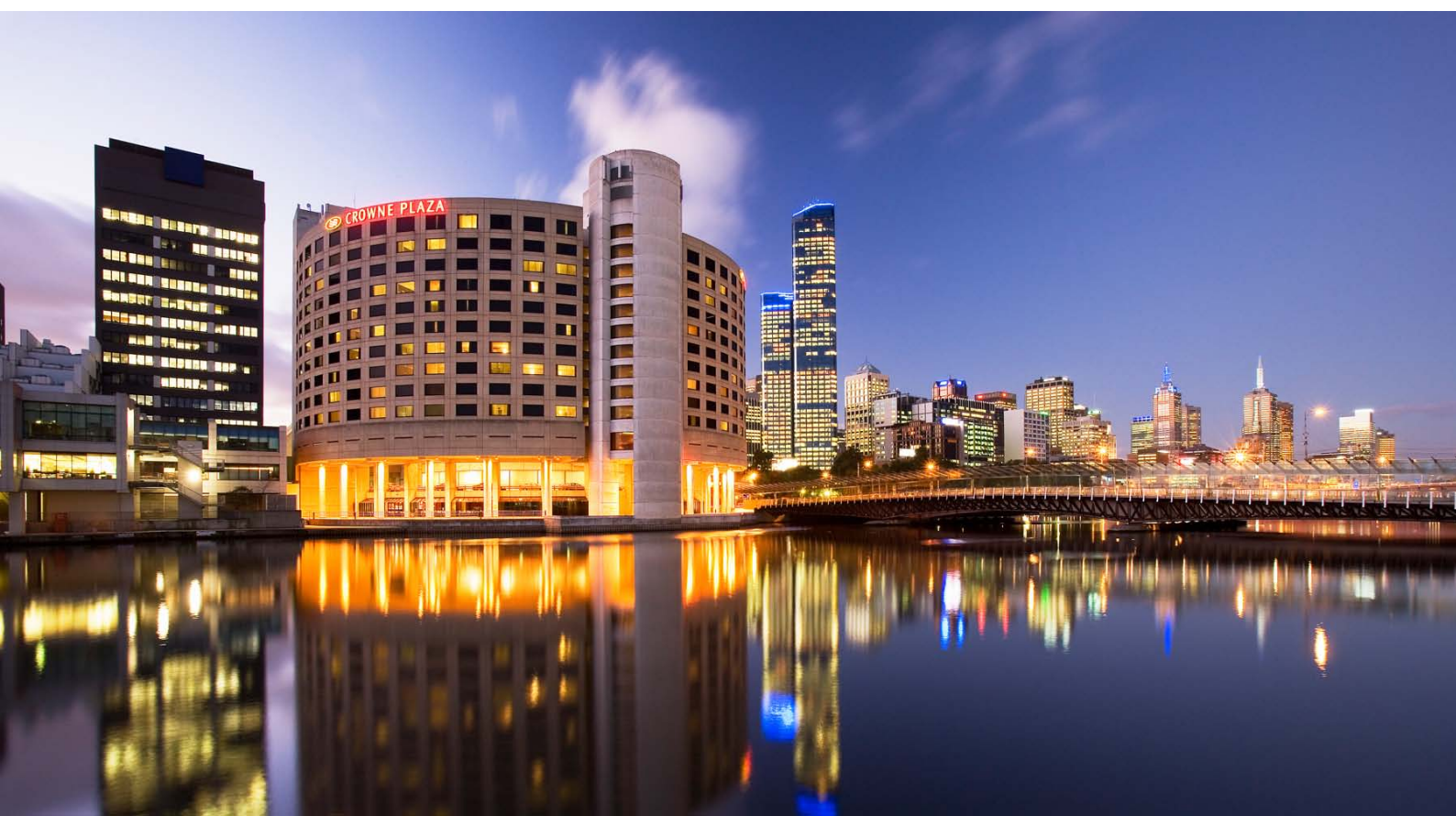
Robert Hecker
Managing Director
Horwath HTL



CROWNE PLAZA MELBOURNE

Managed by InterContinental Hotels Group
Owned by Eureka Funds Management
1-5 Spencer St, Docklands, Melbourne, Victoria, Australia
385 rooms
Originally built in 1989
Rebranded as Crowne Plaza in 2006

In an environment where resources are limited and costs continue to increase, Crowne Plaza Melbourne has implemented operational and engineering initiatives to reduce energy and water consumption and landfill waste. Sustainability programs reduce utility consumption, but also contribute to annual savings that provide high returns on investment for its owners.



THE SPHERE OF INFLUENCE: Cause or Coincidence

There are several reasons why Crowne Plaza Melbourne has become a centre for new environmentally sensitive business practices for IHG hotels in Australia. It is the collaboration from various parties that has allowed the hotel to experiment with various resource saving measures that are not only environmentally responsible, but economically viable.

Government Influence

In light of depleting water resources, rising energy costs and growing landfills in Australia, the city of Melbourne actively encourages its hotels to be more efficient with water, energy and waste. To expedite this process, the city council partnered with Sustainability Victoria, EarthCheck and the Smart Water Fund to develop toolkits to help hotels reduce resource use and improve waste management. Although programs are not mandated, the Savings in the City program has provided individual properties with subsidies to install or improve energy and water efficient equipment. In 2005, the hotel joined Savings in the City as a means to reduce waste, but expanded its commitment to reduce both energy and water use.

IHG – Management Company Influence

IHG has close to 4,500 hotels and with a rapidly growing portfolio, is in a position to initiate company wide sustainability measures that can have positive impacts on how its hotels operate globally. In 2009, the group introduced an online benchmarking tool called Green Engage allowing its hotels to monitor, benchmark and manage their energy and water use and waste production. The purpose of Green Engage is to offer tools to hotels and owners that will reduce operating and maintenance costs as well as the carbon footprint of the property. Used properly, the system has the potential to reduce a hotel's energy costs by 15 to 25%. In 2009, 900 hotels joined the program and collectively reduced their energy use by approximately 10%. IHG hopes to expand the participation of the program and reduce its group-wide energy use by 6 to 10% on a per available room basis between 2010 and 2012.

IHG has a cluster system whereby a designated management team oversees a group of hotels in a region. Crowne Plaza Melbourne is the IHG headquarters for Victoria and the management team is responsible for overseeing 7 additional properties. In addition to leveraging scale, the close networking system allows for the successes of one hotel to be easily duplicated in another. For example, the hotel's creation of a "Green Team", recycling program and use of LED light bulbs will now be rolled out to other Victoria properties. On a wider scale, the hotel's guest engagement program is now being modified for a national rollout by IHG.

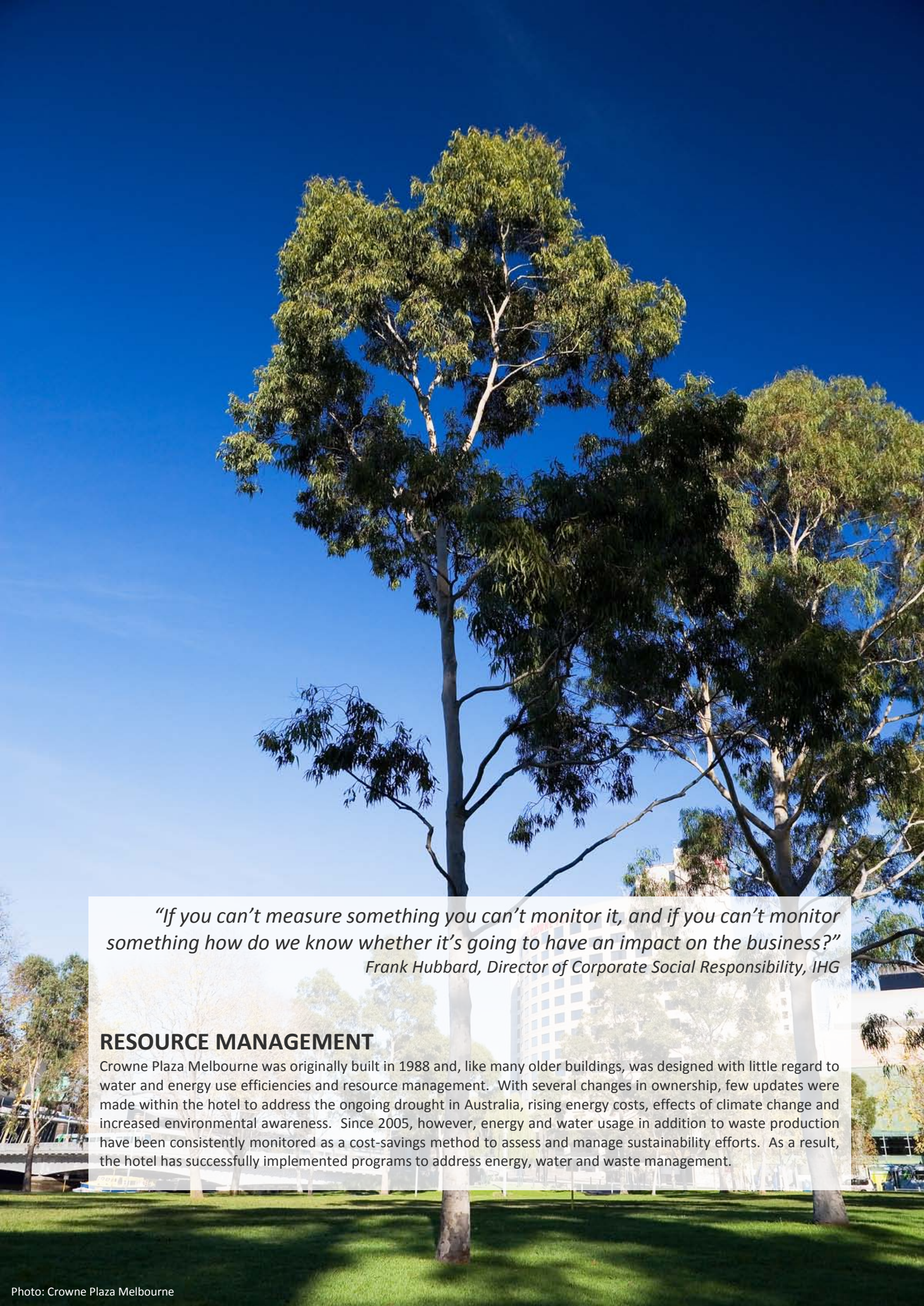
Eureka Funds Management – Ownership Influence

Crowne Plaza Melbourne was purchased by Eureka Funds Management along with 8 other IHG hotels in Australia and New Zealand in 2005 as part of IHG's asset disposal program. Eureka is a fund manager with real estate and development funds and currently owns assets including 9 IHG hotels. Any measures implemented at one property to improve the bottom line can therefore be duplicated at other Eureka owned properties.

Eureka has a strong commitment to responsible investments and is actively involved with Investor Group on Climate Change (IGCC), the Responsible Investment Association Australasia, and is a signatory to the UN Principles for Responsible Investment (UNPRI). These groups raise awareness regarding effects that climate change can have on the investment environment in Australia.

Operations Influence

In 2005 and 2006 the operations team at the nearby Holiday Inn Flinders recognised the hotel could operate more sustainably. Out of personal interest and with the support from IHG and Eureka, the operations team initiated projects that would be resource efficient and yield savings for Eureka. The programs were shared with other properties including Crowne Plaza Melbourne which later became the focal point for new sustainability initiatives. At present, the Area Chief Engineer and his green team continue to implement various methods to improve resource efficiency and save costs.



"If you can't measure something you can't monitor it, and if you can't monitor something how do we know whether it's going to have an impact on the business?"

Frank Hubbard, Director of Corporate Social Responsibility, IHG

RESOURCE MANAGEMENT

Crowne Plaza Melbourne was originally built in 1988 and, like many older buildings, was designed with little regard to water and energy use efficiencies and resource management. With several changes in ownership, few updates were made within the hotel to address the ongoing drought in Australia, rising energy costs, effects of climate change and increased environmental awareness. Since 2005, however, energy and water usage in addition to waste production have been consistently monitored as a cost-savings method to assess and manage sustainability efforts. As a result, the hotel has successfully implemented programs to address energy, water and waste management.

ENERGY

Since 2005, the hotel has reduced its energy usage from 365,000 kWh per month to 260,000 kWh per month despite a higher occupancy in the hotel.

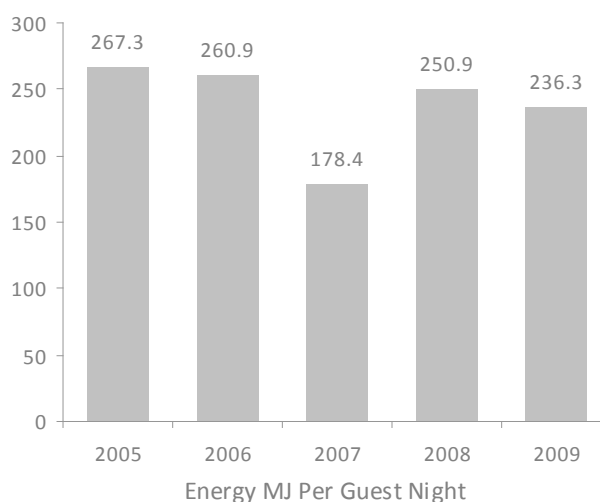
2005 – Energy audit

An energy audit on air conditioners ensured that units were operating efficiently.

2006 – Compact fluorescent bulbs

Energy efficient light bulbs replace incandescent bulbs following a government mandate that bans the use and sale of incandescent bulbs in 2010.

Issues: Although CFL bulbs are often used to replace incandescent bulbs, they contain toxic mercury which makes them difficult to dispose of and can contaminate landfills with toxins that seep into the water tables.



Data: EarthCheck

2007 – Staff training

Staff training raises awareness and employees become more conscious about turning off lights and air conditioning and are adept at reporting mechanical problems that may result in energy waste.

2008 – Variable speed drives

Variable speed drives regulate the speed of pumps and motors during high and low demand periods and are expected to save 30% in energy use. This project was a joint effort with the Savings in the City program and was partly subsidised by the Department of Innovation, Industry and Regional Development.

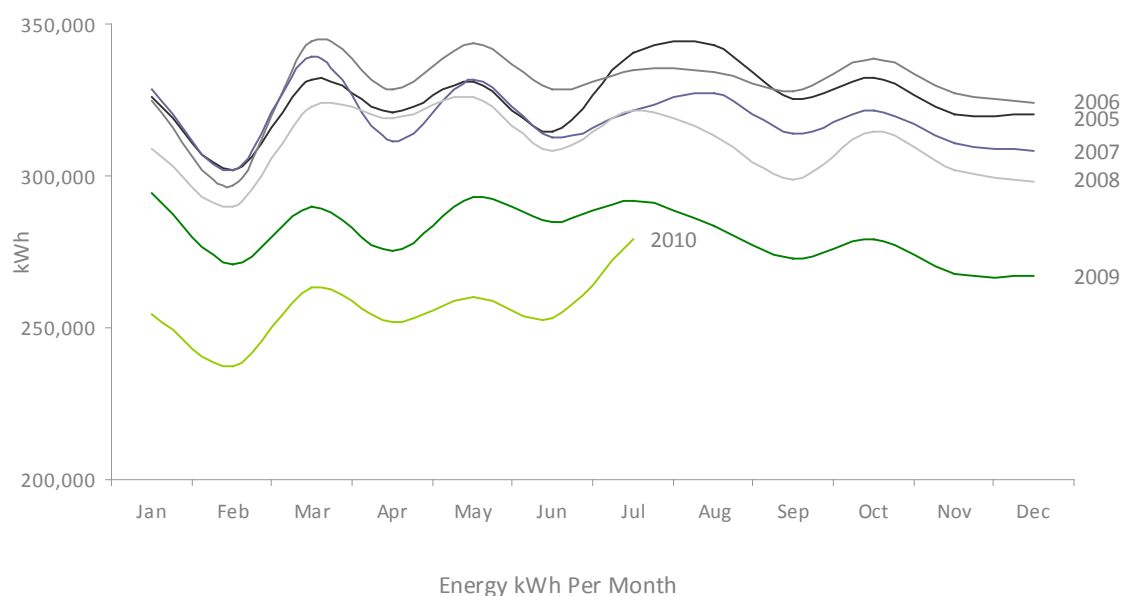
Although the total installation was USD 156,250, the hotel only incurred a cost of USD 67,000. The payback based on current energy costs is 7 to 8 years, however the return on investment is expected to improve as energy prices rise (energy prices increased by 15% upon signing a new contract in early 2010).

2008 – Building management system (BMS)

A BMS provides centralised temperature controls over various areas based on occupancy. Energy use is expected to be 60% more efficient.

2009 – Inncom guestroom controls

A sensor driven guestroom management system can distinguish when a room is vacant to control lights, adjust temperature and can also sense when guests are asleep to moderate temperature to save energy without compromise to guest comfort. This system cost USD 44,600 and is expected to result in approximately 30% savings in energy use in guestrooms compared to hotels that lack a guestroom control system.



2010– Dyson Airblade

Dyson Airblade dryers in public bathrooms use less energy than warm air dryers by blowing air at a speed of 640 kilometers per hour to quickly dry hands. Each dryer cost USD 1,250 but uses 85% less power and saves on both paper towel and maintenance costs. In previous years, the hotel spent approximately USD 6,250 per year to purchase paper towels, which results in a 1 year payback for the Dyson Airblade dryers.

2010 – mySmart EnGauge

The mySmart EnGauge monitor is a pilot program that will raise awareness from guests regarding energy use by displaying up to date energy consumption and savings for the hotel in the lobby.

2010 – LED lights

After monitoring the development of LED lights for several years, the hotel has started to replace some of its light bulbs with more efficient and longer lasting LED bulbs. The first area to be converted was the lobby atrium which is expected to save significantly in bulb, energy and maintenance costs.

LED Savings for Crowne Plaza Atrium

	Halogen	LED
Heat Generation	Yes	none
Mechanical Failure	Very possible	Rare
Life Span (on average)	2,000 Hrs (<3 months)	50,000 Hrs (5.7 Yrs)
Bulb Wattage	50 Watts	9 Watts
Bulb Cost (per piece)	USD 3.53	USD 67
LED Transformer & Installation (per piece)	-	USD 29
One Time Transformer/Installation Cost (130 pieces)	USD 0	USD 3,714
5.7 Year Energy Use per Year	324,558 Watts	58,420 Watts
5.7 Year Bulb cost (130 pieces)	USD 11,462	USD 8,705
5.7 Year Maintenance Cost (equipment rental)	USD 96,318	USD 2,679
5.7 Year Energy Cost (AUD 0.0691 per kWh)	USD 20,051	USD 3,609
5.7 Year Total Cost	USD 127,832	USD 18,707

Based on USD 1 = AUD 1.12

Benefits

- Annual savings of approximately USD 19,000 per year regardless of hotel occupancy
- 8 month payback period
- Reduction in 68 tons of greenhouse gas emissions per year, or 391 tons of greenhouse gas emissions per LED lifespan
- The frequency of mechanical failure is low so general maintenance is reduced
- Each LED bulb reduces landfill waste by 25 incandescent bulbs
- LED lights do not contain mercury that can have dangerous effects on the environment when disposed of.
- LED lights do not generate heat which can reduce the air conditioning load for a hotel in the summer time

Limitations

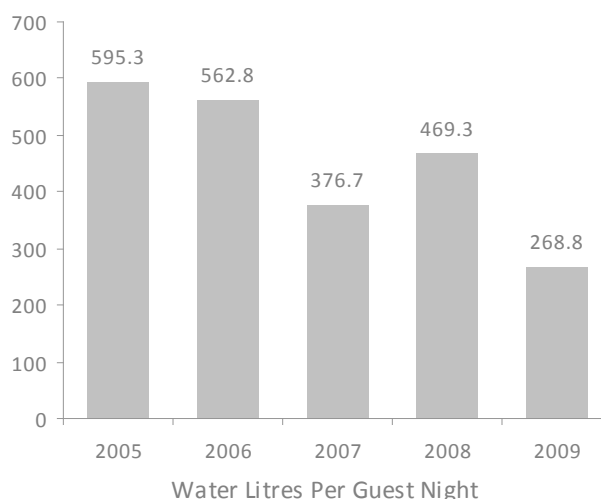
- LED lights are still expensive to source
- Most LED lights can only illuminate from a 3 meter ceiling and are not dimmable
- LED bulbs that need to illuminate large areas or from high ceilings (like those used in Crowne Plaza's 12 meter atrium) can cost significantly more than standard bulbs that are used for 3 meter high ceilings
- The payback period is longer for areas that do not incur high costs associated with additional equipment rental despite the lower cost for bulbs that do not require the same luminescence needed in the atrium

WATER

With continued drought warnings, stressed water supplies and increasing water costs in Australia, the hotel has implemented changes to reduce water use per guest night from 595 litres per guest night in 2006 to 470 litres per guest night in 2009.

Challenges

The Crowne Plaza Melbourne shares its water bills with the adjacent convention centre which has resulted in inconsistent meter estimates over recent years. Now that the convention centre is closed, the hotel will be able to more accurately gauge its water use.



Data: EarthCheck

2006 – Methven shower jets

Special shower jet heads make flow restricted water feel like 18 litres per minute. Each shower head cost USD 107 each with a total investment of approximately USD 41,075.

2007 – Flow restrictors

Flow restrictors reduce water pressure in guestrooms from 12 litres per minute to 9 litres per minute. Flow restrictors cost USD 37,500 and have a payback of less than 2 years by reducing water use by an estimated 30,000 kilolitres per year. Water savings is estimated to be USD 26,785 per year.

2004 – Dual flush toilets

Dual flush toilets in guestrooms allow guests to save water by opting to use 3 or 6 litres of water per flush compared to conventional toilets that use 9 litres. They will be installed in public areas in the near future.

2006 – Staff training

Staff training raises awareness and employees become more conscious about leaving taps on and are encouraged to report leaks to expedite repairs.

2009 – Waterless urinals

Waterless urinals in public restrooms replace traditional urinals that require 6 to 12 litres of water per flush.

Waterless Urinals

Conventional urinals use large amounts of water and generate equal amounts of waste water. A waterless urinal uses a biodegradable and non-toxic cube that acts as a microbiological system to virtually eliminate the need for water. The system utilises a one-way valve which permits urine to pass into the plumbing system but restrict odours from diffusing back into the washroom. Only 10 litres of water are needed per day to activate the system and to remove degraded matter.

Benefits

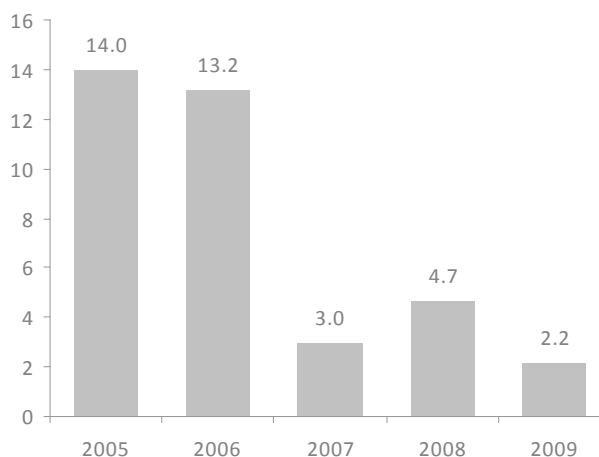
- 10 litres of water per day versus 9 litres per flush
- Reduces wastewater discharge
- Biodegradable and non-toxic
- Eliminates the need to use toxic cleaning agents, sanitizers and acid treatments
- Yields cost savings due to water reduction, maintenance reduction and the elimination of chemical use

WASTE

In 2005, the hotel participated in a waste audit with Savings In the City Waste Wise program and has since implemented several initiatives to reduce waste production and divert solid waste from landfill sites.

Waste Minimization

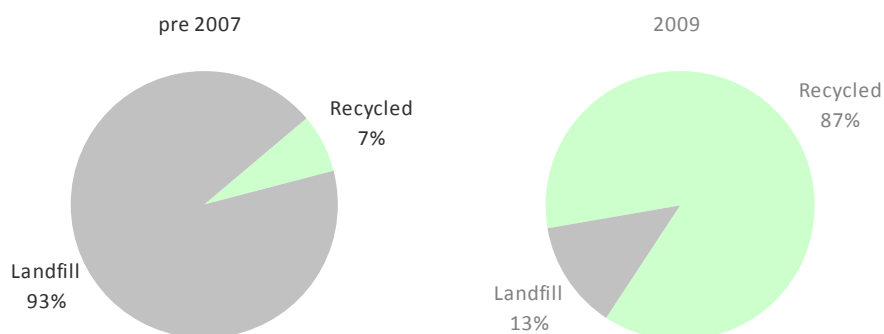
- Bulk purchasing reduces packaging
- Environmentally friendly packaging for bathroom amenities from Plastarch reduces plastic waste
- Dyson Airblade dryers in public bathrooms eliminate the use of paper towels
- The conversion to LED lights will reduce the number of fluorescent light bulbs with mercury content from going to landfills
- Water served in pitchers for meetings reduces plastic bottle waste



Data: EarthCheck Waste Litres Per Guest Night

Recycling

Although many hotels have had difficulty enforcing proper recycling programs, Crowne Plaza has successfully implemented programs to encourage guests and employees to separate their waste. Crowne Plaza now recycles 87% of its non-organic waste compared to only 7% before 2007 and has reduced its waster removal cost by approximately USD 8,500 per year. In addition, they can earn a small sum of approximately USD 500 per year from selling recyclables to recycling centres in Melbourne.



- Detailed waste audits can highlight areas where recycling can divert landfill waste and save on waste removal costs
- An audit in 2008 found that 46% of landfill waste had the potential to be recycled
- Recycling bins are placed in each guestroom
- Employee training is conducted and there is a stringent recycling program in the back of house areas
- The hotel recycles paper, cardboard, plastic bottles and glass
- Close to 90% of cardboard is currently recycled

Areas for improvement

- A garbage compactor will reduce the space needed to store garbage and the number of waste pickups
- The hotel considered composting organic waste, however issues regarding pickup frequency, smell and pest control make composting impractical
- Additional measures will be taken to improve recycling efficiency in guestrooms and in the back of house

CROWNE PLAZA MELBOURNE: BUSINESS CASE OVERVIEW

Key Takeaways

Significant changes can be made to older buildings that can improve efficiency and reduce waste and costs. Where possible, Crowne Plaza is upgrading the hotel to incorporate resource saving and waste reduction programs that improve the efficiency of the hotel and save costs.

Cost Savings

In an environment where energy costs are rising and water is limited, the implementation of resource saving programs will be the only way to reduce costs.

Brand Positioning

Credible brand positioning cannot be achieved if initiatives are not mainstreamed across all properties. Crowne Plaza Melbourne does not market its sustainability commitments because initiatives are inconsistent with other Crowne Plaza properties and can cause brand confusion. However, once similar programs are adopted in other Crowne Plaza and IHG hotels, there is potential to improve a brand's image in an environment where guests and meeting groups are becoming more aware of environmental sustainability.

Why They Do It?

As water supplies become depleted and less secure as a result of climate change, energy costs rise and landfill charges increase, Crowne Plaza Melbourne recognises that early implementation of resource saving measures can have long term savings that will outweigh investment costs. The hotel also hopes to lead by example for other urban hotels that wish to save on resources, by showing that savings are automatically reflected in the bottom line. Sharing data and experiences is an important element of Crowne Plaza's commitment to this.

Acknowledgements:

Crowne Plaza Melbourne
David Travers, Crowne Plaza Melbourne, General Manager
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Doug Smith, Crowne Plaza Melbourne, Rooms Division Manager
Eric MacDonald, AHS Hospitality Group, Housekeeping Manager

Sources:

City of Melbourne (www.melbourne.vic.gov.au)
Eureka Funds Management (www.eurekafm.com.au)
EnGauge (www.engage.net.au)

EVASON PHUKET

Managed by Six Senses Resorts & Spas
Owned by Evason Phuket Limited
100 Moo 2, Vised Road 83130, Phuket, Thailand
260 rooms incl 28 units with private pools
Originally built in 1972
Redeveloped in 2001

When Phuket Island Resort opened in 1972 on Rawai Beach on the south eastern side of Phuket, tourism was still in its infancy, resources were plentiful, the environment was pristine, buildings were designed with little regard to energy and water efficiencies, and few controls were established to protect the area. The unspoiled condition of Phuket rapidly shifted the island's focus from tin mining to tourism as it became a leading international destination. Between 1989 and 2009, visitor arrivals skyrocketed from just less than 1 million to 2.7 million. Although the evolution of tourism supported the local economy and business developers, rapid overdevelopment and lack of planning controls continue to have negative impacts on the environment of Phuket and have resulted in deteriorating ecosystems, loss of wildlife, destruction of marine habitats, pollution, strained demands on energy and water, the increase of landfill waste and disposal of waste water into the ocean.

In 2000, Six Senses acquired the 3-star property which included 25.9 hectares on the main island and 6.5 hectares on a private island, located 10 minutes away by boat. Recognizing that resources are limited and with a company devotion to environmental sustainability, Six Senses made a commitment to reduce the environmental impact associated with the redevelopment and repositioning of the property as an environmentally responsible resort destination. While Evason Phuket acknowledges that a single operator would have difficulty addressing the cumulative impacts of other resorts and tourism in Phuket, they strive to lead by example both within the community and hospitality industry.



ENVIRONMENTAL COMMITMENT

Evason Phuket's commitment to the environment and community is one that begins with the Six Senses corporate office and trickles down to each property and employee, or host. Like most Six Senses properties, Evason Phuket also has a dedicated Social and Environmental Officer who collaborates with resort operations to implement programs to reduce energy, water and waste and develop community outreach programs. Regular monitoring of each program highlights areas of progress and key areas for improvement, the findings of which are reported in a publicly available annual Sustainability Report.

While ultimate responsibility lies in the hands of the area director and CEO of Six Senses, the company ethos is one that resonates with all employees who are trained to be aware of resource use and waste reduction.

With a dedicated officer and support from Six Senses, Evason Phuket has been able to reduce the property's impact on the environment despite the addition of several energy consuming facilities including new pools, kitchens, a garden irrigation network, an enhanced fitness centre and spa and children's club. The combination of strategic redevelopment and environmentally sound operating practices results in a streamlined operation with a focus on energy, water and waste management that operates more efficiently and more profitably than it did as a 3-star resort. Although the property's environmental commitment may not be a decision making factor for most guests, findings are that most guests leave with a greater understanding of sustainable tourism practices, and often return to Six Senses properties for their social and environmental commitment.

Building Reuse is the most significant form of recycling

Instead of demolishing the 28 year old resort structure, which had naturally become outdated in relation to energy and water use efficiencies, major resort structures were retained, buildings were retrofitted, equipment was replaced and the sparse landscape was regenerated. By redesigning and retrofitting the existing structures with higher quality furnishings, fixtures and equipment, the property was radically transformed without the negative impacts on the environment related to building demolition, resource demands for new building materials and landfill of old. Reuse of the existing structures also dramatically reduced energy consumption and carbon emissions related to manufacturing and transporting building materials and constructing of new buildings.

To improve product positioning, Six Senses also employed time tested design techniques and added a range of new facilities and services to reflect a top-tier resort. Despite the addition of energy and water consuming facilities and services, the resort continues to exhibit increased efficiency and dramatic financial savings.



“To create innovative and enlightening experiences that rejuvenates our guest’s love of SLOW LIFE (Sustainable-Local-Organic-Wholesome Learning-Inspiring-Fun-Experiences)”
Environmental and Social Sustainability Policy, Six Senses

ENERGY

The installation of an energy monitoring system and replacement of major equipment has contributed greatly to the reduced energy requirements of the resort. The energy monitoring system, which controls timers for lighting, pumps and other systems, has resulted in a 10 percent savings in energy use per year compared to prior demand. Together with new equipment, the property has been able to minimise energy use and employ a number of new and innovative measures to further reduce energy consumption.

*Prior to 2001, Phuket Island Resort required the use of two 1,300 kW transformers.
Evason Phuket now operates approximately 40 percent more efficiently
and only requires the use of one 1,100 kW transformer.*

Design Strategies

Design strategies implemented to reduce energy consumption include the following:

- Open air structures in public spaces provide natural air ventilation and light and eliminate the need for air conditioning of public spaces throughout the year and supplemental lighting during the day
- Open style bathrooms not only create the feeling of more space, but also allow for natural light/ reduced energy demand
- Windows with UV film insulate rooms and reduce the air conditioning load
- Use of landscaping throughout the resort provides a sound buffer, privacy screen and cool shade, and in some cases can provide shading that reduces the air conditioning load on a neighbouring building
- A water feature in the lobby doubles as a design element as well as providing insulation for meeting facilities below (use of such features as insulation in several Six Senses properties reduces the demand for air conditioning)
- The redesign of the kitchen with refrigerators built into the wall allows for heat to be dissipated directly outdoors creating a better working environment and reducing air conditioning needs in the kitchen, while the open kitchen design maximises natural ventilation and lighting



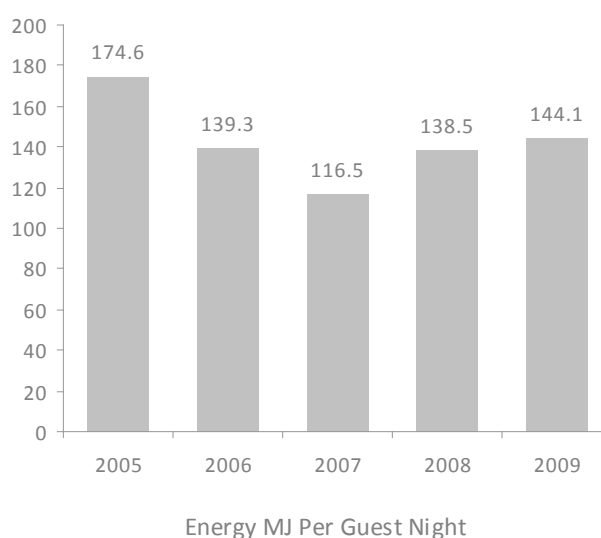
“You can never be perfect. There is always room for improvement”
Arnfinn Oines, Social & Environmental Conscience, Six Senses

Energy Efficient Equipment

An energy monitoring system which monitors and controls peaks in demand has achieved a 10% saving in energy use.

A centralised mini-chiller system which replaced split type air conditioning has improved energy consumption by 510,000 kWh per year. The system, which cost USD 130,000 saves USD 44,000 per year and has a payback period of 3 years.

By placing water tanks at the highest point of the property, gravity is used to distribute water throughout the resort instead of energy consuming water pumps. *Limitations: Not possible for properties with flat topography.*



Data: EarthCheck

High voltage (6.6 kV) underground electrical cables reduce the visual impact on the resort from electrical poles and wiring, but also reduce thermal and amperage loss associated with overland cables. *Challenges: More difficult to retrofit an existing property.*

Garden lighting uses energy efficient compact fluorescent bulbs and is minimised to improve the resort ambiance and reduce light pollution that can affect wildlife. *Future outlook: Although many hotels now use compact fluorescent bulbs, LED lights are becoming more prevalent. LED lights are energy efficient, last up to 10 times longer than compact fluorescent bulbs, require less replacement and maintenance, do not cause heat build up, and lack the toxic mercury content found in compact fluorescent bulbs. At present, Six Senses properties are investigating the conversion to LED lights for new and existing properties.*

Heated Water

A solar thermal hot water plant on the roof of the main building heats water for showers using solar energy instead of gas or electricity for the main guestrooms. *Limitations: Only viable for properties that have the surface area for solar panels.*

For the resort's pool villas, quantum heat recovery pumps that extract heat from the ambient surroundings are used to heat water. With 30 to 40 percent higher efficiency than conventional hot water pumps, the system which cost USD 9,000 saves approximately USD 7,500 per year. *Limitations: Mostly viable for villas or independent units where there is little distance between the water pumps and the villas.*

The diesel laundry hot water boiler was replaced with an LPG gas boiler which reduces the carbon emissions from traditional diesel or electricity boilers. The gas boiler cost USD 27,000 and saves USD 17,000 per year.

The increase in energy use per guest night in 2008 and 2009 are a result of lower hotel occupancy and fewer guest nights to share the energy load from the resort's public facilities.

RAIN: A VALUABLE RESOURCE

Because the area where the resort is located does not have access to the city's municipal water supply, Phuket Island Resort used to purchase water from private companies that would be transported in trucks and stored in water tanks prior to 2000. Evason Phuket built its own reservoir on a 2,000 square meter site to eliminate the resort's reliance on outside sources. The self sustained reservoir which is filled from rainwater not only reduces the carbon footprint associated with water transportation, but has resulted in significant cost savings. The installation of the reservoir and equipment costing USD 36,000 reaps an annual savings of USD 330,000.

Limitations: This is only viable for projects that have the land and rainfall to support the reservoir. During unseasonably low rain periods, a hotel may also require a backup support system via well, purchasing water or accessing the municipal supply, if available.

Future outlook: Water risk is clearly emerging as an increasingly important factor in many businesses, but many municipalities still heavily subsidise its costs which may reduce the economic viability for an on-site reservoir. However, as water shortages arise and subsidies diminish, hotels that have already implemented water saving measures will not only benefit from a cost savings perspective but may derive other benefits including a social license to operate from local communities for demonstrating water conservation practices and reducing water security risks to local communities.



From Rain Water to Tap Water

- Step 1 Rain fills the reservoir via natural run-off
- Step 2 Water is pumped through a coagulation and sediment filtration tank
- Step 3 Water is treated through carbon and resin filters to soften water and a mild dose of chlorine peroxide to eliminate bacteria
- Step 4 Treated water is pumped to holding tanks on higher ground
- Step 5 Water is distributed to the resort via gravity, further reducing the energy required of pumps



Water Liters Per Guest Night

Data: EarthCheck

Although the resort still uses 682 litres of water per guest night, it is important to recognise that this is from its own self-sufficient rain water catchment

From Tap Water to Drinking Water

Benefits of producing your own drinking water include the lower carbon footprint from packaging and transporting of bottled water, the reduction of plastic waste by using reusable glass bottles, and increased guest awareness. *At present, consumption averages approximately 4 litres of water per occupied room per day.*

- Step 1 Tap water treated via reverse osmosis and UV light to produce safe drinking water
- Step 2 Water is re-mineralized to provide mineral rich drinking water
- Step 3 Water is bottled or processed through an additional step to produce carbonated water
- Step 4 Bottles are sealed and provided in each guestroom and in the restaurants
- Step 5 Used bottles are cleaned and disinfected before reuse



Photo: Y Jong

*Making drinking water **eliminates up to 380,000 plastic bottles** from going to the landfill per year and reduces carbon emissions related to the bottling and transporting of bottled water*

Reducing Water Use

Although tap water comes from the resort's reservoir, additional measures have been taken to reduce water use and water waste.

- low flow toilets
- push valves in all back of house areas
- water saving plumbing for taps and shower heads
- waterless urinals that use microbial technology to eliminate odour without use of constant flush system

From Waste Water to Irrigation Water

All waste water from the resort is treated via a gravel filtration aerobic system. Treated waste water is then used for garden irrigation, both as a means to supplement rain water and to prevent waste water discharge into the ocean, as found in many other resorts. The savings associated with waste water treatment depend on the cost of water and the cost of waste water removal. Although the resort has its own water supply, the estimated savings of using treated waste water for irrigation as an alternative to purchasing water is approximately USD 150,000 per year. Surplus waste water is then pumped into a small artificial lake which has created an additional habitat for migratory birds. This, in combination with the improved landscaping, has resulted in notable increases in the biodiversity of the area and return of native flora and fauna.

0% waste water discharge into the sea

\$0 cost for waste water removal

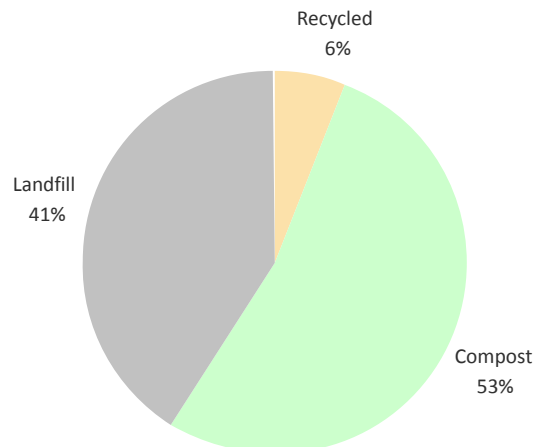
100% recycled water used for irrigation

Improvement of flora to attract wildlife and migratory birds



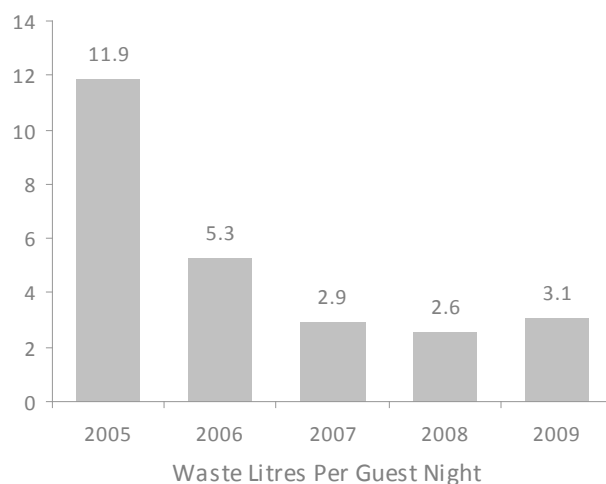
WASTE MANAGEMENT

Between 2005 and 2008, the resort has monitored a 78 percent reduction in the amount of solid waste sent to landfills despite 61 percent more guests. This reduction in waste was a direct result of programs that were initiated to reduce waste production and improve waste management.



Eliminating potential for waste

- By creating their own drinking water and bottling it in reusable glass bottles, the resort drastically reduces the amount of plastic waste
- Ceramic containers are used for bathroom amenities in rooms and public to eliminate the use of disposable plastic bottles that are typically sent to landfills
- Paper packaging of other bathroom amenities and gift shop items reduces use of plastic materials
- Suppliers are asked to reduce packaging and deliver in bulk to minimise packaging waste



Data: EarthCheck

Composting accounts for up to 53% of total waste

The greatest contributor to the waste management program was the introduction of a composting program in 2005. With over 50 percent of waste being organic, the composting program resulted in less waste removal to the landfill. The additional benefits include a lower carbon footprint relative to the transportation of waste, savings related to waste removal, and the production of rich organic compost material that is used as fertiliser in the resort's gardens and landscaping.

Reduces landfill waste

Breaks down organic matter into humus which contains nutrients absent in synthetic fertilisers

Reduces the need for water, fertilisers, and pesticides



ONE MAN'S TRASH IS ANOTHER MAN'S TREASURE

Recycling and Upcycling

Although recycling bins are not offered in guestrooms, all waste is separated into papers, glass, plastics and other waste by resort staff. All waste is separated so that recyclable materials can be sold. Recyclables account for 6 percentage of waste or about 25 tons per year.

In addition to managing their own waste, Six Senses uses what could be considered waste by others as both construction and design materials. Driftwood from the sea is often used as design pieces, old railway sleepers are used in garden walkways, and 140 mature trees from an oil palm tree plantation that were designated for removal due to low oil yields were transplanted to create immediate landscaping throughout the resort.



CREATING CLEAN ENERGY FROM WASTE MATERIALS

The resort is currently experimenting with bio-diesel from used kitchen oil and bio-mass plants to support fuel for the chipping machine and to support the air conditioning load for the resort's general store without the need for diesel fuel.

On-Site Bio-Diesel Production

Used cooking oil is currently mixed with 5 to 10 percent of regular diesel for use in the chipping machine. According to the US Environmental Protection Agency, biodiesel from waste grease results in an 86 percent reduction in greenhouse gases compared to fossil diesel. *Limitations: Only viable for properties that have sufficient kitchen oil waste or waste grease.*



On-Site Bio-Mass Plant

The resort installed the country's first biomass absorption chiller which burns garden waste and produces clean air conditioning for the resort's general store. The investment of USD 115,000 saves USD 41,000 annually in fuel costs. *Limitations: Only viable for properties that have sufficient garden waste that can be burned.*





LANDSCAPING PRACTICES

Landscape Regeneration

Because the site was largely barren when acquired, Six Senses carefully identified plants that would be able to rapidly enhance the resort atmosphere. Transplanting mature trees from an oil palm plantation that was earmarked for destruction created an instant arrival experience throughout the resort's entrance driveway, rapidly growing bamboo was used around the property, and the reintroduction of native plants contributed to the increased population of wildlife in the area. The overall effect of landscape regeneration enhances the destination appeal of the property, creates privacy screens, shades and cools public areas, and acts as a sound buffer for outdoor pool and activity areas.

Organic Gardening

Mulch compost produced on site eliminates the need for additional fertilisers and chemicals that would be necessary to keep non-native species alive. Garden mulch also reduces water evaporation which reduces water demands on the gardens. Although supplemental watering is rarely required as native plants can subsist on regional rainfall patterns, treated wastewater is used to further irrigate plants when necessary without the additional requirements of a fresh water supply.

Compost material is also used in the nursery to assist with the germination of new plants.

To protect gardens from harmful insects, the resort planted insect repelling lemongrass plants throughout its gardens, and keeps fish in the ponds that feed on insect larvae.

Herb and Vegetable Garden

The herb and vegetable garden is an organic garden that grows seasonal herbs, fruit and vegetables. The use of an on-site garden supplies the resort with some fresh organic produce for use on the property, and reduces the food miles associated with food imports and deliveries.

COMMUNITY OUTREACH

Community outreach is an important element of the Six Senses social sustainability policy. Like other Six Senses properties, the SLOWLIFE ethos is one based on Sustainable-Local-Organic-Wholesome-Learning-Inspiring-Fun-Experiences. As part of this, the resort maintains an educational SLOWLIFE Trail that meanders through the herb and vegetable garden, the waste water pond, the waste water treatment plant, the biomass and bio-diesel plants, the recycling area and nursery. In addition to offering scheduled tours to resort guests, the resort hosts regular visits to the property from local schools. Up to the end of 2009, the property has guided approximately 1,800 participants, of which approximately 90 percent are local school children.

Other community support programs include the following:

- Offering job opportunities to the local community
- Giving preference to local suppliers and locally sourced products
- Planting over 2.8 hectares of mangroves in cooperation with the Provincial Environmental Protection Department
- Supporting the Marine Biology Institution in Phuket, which protects corals and marine life
- Organizing beach and reef cleaning activities on a regular basis
- Initiation of an English training programme called English Learning for the Children of Evason
- Encouraging guests to off-set their carbon emissions from flying with Six Senses Carbon Offset Programme
- Encouraging guests to donate to various foundations



EVASON PHUKET - ENVIRONMENTAL & SOCIAL SUSTAINABILITY POLICY

We care for a better environment and our place within the local community!

Evason Phuket, Six Senses Spa and the hosts are committed to reducing the negative environmental and social impact from activities associated with the resort and spa industry, namely providing accommodation, dining, excursions, spa experiences, sports and aquatic activities. We are committed to developing a sustainable environment by using the indicators set out by The Green Globe 21 Benchmarking format highlighted below. We will continuously monitor our performance and sustainable activities against the targets and goals set by EarthCheck benchmarks, which will be adjusted, amended and acted upon wherever appropriate, and we will continue to submit performance data on an annual basis to EarthCheck.

Our EarthCheck indicators include:

- We shall reduce greenhouse gas emissions through energy efficiency, conservation and management.*
- We shall reduce water consumption through management of freshwater resources.*
- We shall preserve our ecosystem, particularly at Bon Island, but also within our resort as well as nearby surrounding areas.*
- We shall raise social and cultural issues through involvement and contribution to local communities.*
- We shall utilise and manage our land in order to preserve the environment and provide a natural habitat for wildlife and vegetation.*
- We shall protect the air quality both inside our buildings and outside and control noise pollution to not negatively affect guests, hosts nor neighbours.*
- We shall treat all our waste water to avoid polluting discharges.*
- We shall minimise waste production through reduction, reuse, and recycling of products.*

To support our environmental and social sustainability activities we have developed policies and procedures in line with the Green Globe 21 standard. These policies and procedures will be reviewed at least annually to ensure that we are always current in our approaches.

We are committed to comply, and wherever possible to improve upon, Thai and international legislative environmental requirements, such as environmental, public and occupational health and safety, hygiene and employment legislation. We shall, wherever possible and feasible, give preference to the employment of persons living in Rawai or nearby areas, local products and services which do not adversely affect the resort's operational activities, viability and environmental and social impacts.

This environmental and social policy is freely available to all interested parties on request.

*Mr. Frank Grassmann,
General Manager*



EVASON PHUKET: BUSINESS CASE OVERVIEW

Key Takeaways

Significant changes can be made to older buildings that can improve efficiency and reduce waste and costs. Although Evason Phuket upgraded an existing resort with more facilities, staff and services, the resort uses fewer resources and produces less landfill waste than it did previously.

Cost Savings

The installation of resource efficient equipment is both environmentally sensible and economically viable. For Evason Phuket, the installation of new equipment reduced its reliance on costly energy and water supplies and continues to save significantly for the resort.

Item	Investment	Benefit	Payback
Energy Monitoring System	USD 11,000	Estimated 10% annual savings	n/a
Quantum Heat Recovery	USD 9,000	USD 7,500 annual savings	1.2 years
Centralised Mini Chiller	USD 130,000	USD 44,000 annual savings	2.8 years
Energy Efficient Light Bulbs	USD 8,500	USD 17,000 annual savings	6 months
Biomass Absorption Chiller	USD 115,000	USD 41,000 annual savings	2.8 years
LPG Boilers for Laundry	USD 27,000	USD 17,000 annual savings	1.6 years
Rainwater Reservoir	USD 36,000	USD 330,000 annual savings*	1 month

* Estimated cost if water is purchased from private water companies

Revenue Enhancement and Customer Loyalty

Although many sustainability initiatives do not have a direct impact on the guest experience, awareness programs may result in potential repeat business as hotel guests become more environmentally conscious. Evason Phuket's policies and practices are made transparent through information and tours provided to guests. While sustainability is not a primary decision making factor, more guests are expressing an understanding for sustainable tourism and are likely to make decisions based on CSR policies in the future.

Brand Positioning

Brand positioning can be positively impacted by implementing environmentally and socially sustainable business practices for new build hotels and renovation projects. Evason Phuket demonstrates the ability to reposition an existing resort from a 3 to 5-star product while having less of an impact on the environment.

Why They Do It?

Evason Phuket realises that while they cannot address the cumulative impacts tourism has had in Phuket, the resort hopes that its community involvement and guest education programs can influence society and the way the tourism and hospitality sectors address climate change and adaptation needs.

Acknowledgements:

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Alain Ruffier, Evason Phuket & Six Senses Spa, Executive Assistant Manager (F&B)

Sources:

Six Senses Environmental Policy (www.sixsenses.com/Evason-Phuket/Environment)
Environmental Protection Agency (www.epa.gov)

INTERCONTINENTAL

BORA BORA RESORT & THALASSO SPA

Managed by InterContinental Hotel Group
Developed by Tahiti Beachcomber SA, a subsidiary of Pacific Beachcomber SC
Bora Bora Island, French Polynesia
83 Villas
Opened in 2006

Between 1998 and 2006, an entrepreneur in French Polynesia acquired a portfolio of four resorts on the islands of Tahiti and Bora Bora, added two existing resorts to the portfolio, founded a non-profit organization focused on environmental conservation, and built the world's first hotel using a seawater air conditioning (SWAC) system. In tropical environments where hotels rely heavily on air conditioning and cooling, SWAC at InterContinental Bora Bora & Thalasso Spa provides environmentally friendly and cost efficient air conditioning and refrigeration for the front and back of house, reducing the resort's energy bill by approximately 40%. The successful installation of SWAC provides a long term solution to rising energy costs and reduces green house gas emissions.

Tahiti Beachcomber SA (TBSA), a subsidiary of the Pacific Beachcomber SC Company (PBSC), with six resorts and a cruise ship in French Polynesia. Resorts are managed by InterContinental Hotel Group (IHG) or TBSA's management company, Maitai Hotels.



*“The capacity is much greater than we anticipated,
the water is much colder than we expected”*

Richard Bailey, CEO & Chairman, PBSC

SEAWATER AIR CONDITIONING (SWAC)

Traditional air conditioning systems generally consume 40% of the energy load for resorts in tropical locations and in many cases (particularly in developing nations) still release high levels of chlorofluorocarbons (CFCs) responsible for ozone depletion and global warming. Understanding issues related to high energy costs in French Polynesia and environmental impacts associated with CFCs, the group sought an alternative solution to reduce energy consumption and improve environmental sustainability, leading to the development of the first SWAC system to be privately owned and used in a hotel application.

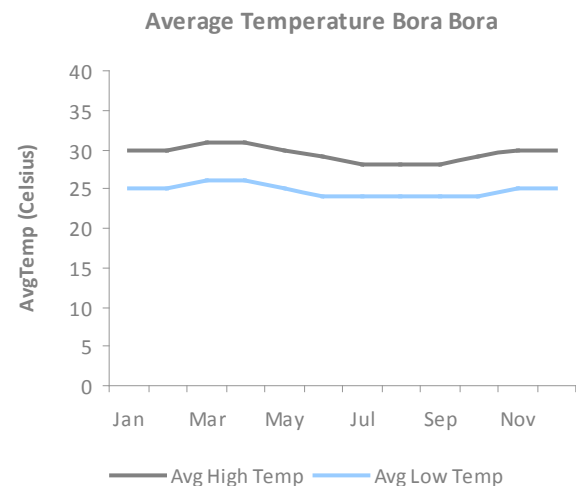


Chart: www.climate-charts.com

Driving Forces

- High demand for air-conditioning in Bora-Bora
- Energy costs that exceed most other nations (approximately USD 0.48 per kilowatt hour)
- Environmental impacts associated with greenhouse gas emissions from fuel imports

Required Assessments

- Q – How much air conditioning is required?
- Q – How much cold water is required?
- Q – Are oceanographic conditions suitable?
- Q – What are the technical specifications?
- Q – What are environmental risks?
- Q – What are mechanical risks?

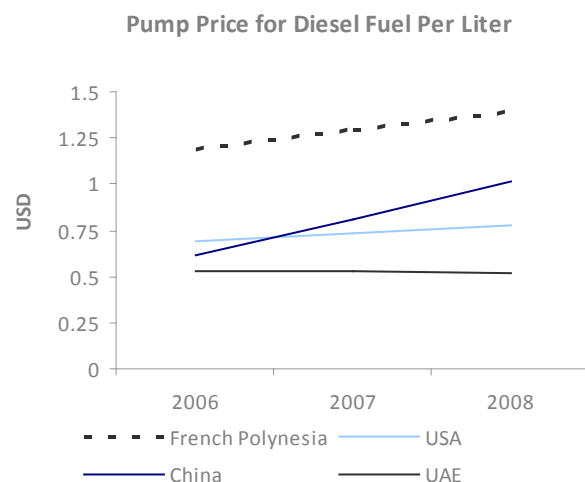


Chart: tradingeconomics.com

How it works

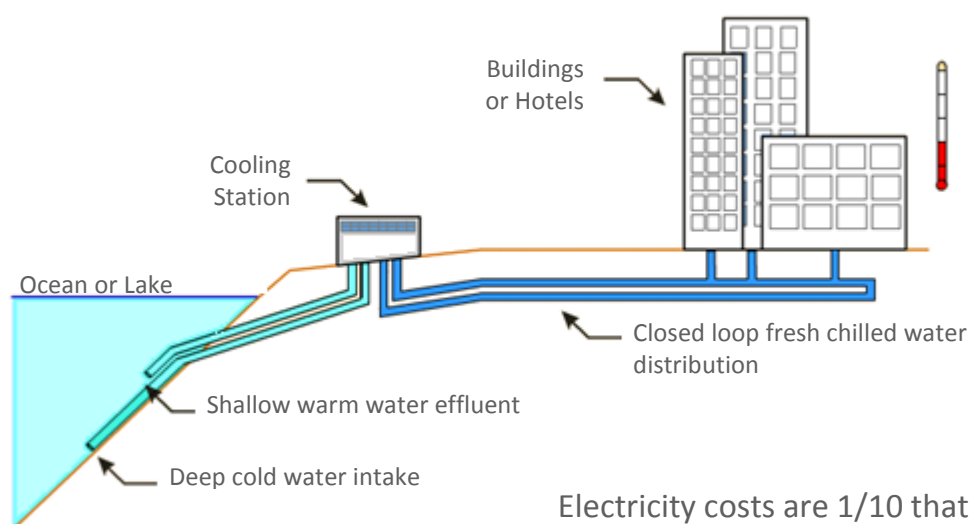
SWAC is a simple system using cold sea-water to cool a chilled-water air conditioning system.

1. Cold deep seawater at a temperature between 5 and 5.5 degrees Celsius rises from a depth of 900 meters below sea level to the surface using capillary pressure
2. The seawater, now at an increased temperature of 6 or 7 degrees Celsius, is pumped ashore using an efficient 13 kilowatt pump to reach the hotel
3. Seawater is then pumped through a non-corrosive titanium thermal exchanger to cool a separate freshwater circuit through conduction (separating seawater from freshwater prevents pipe corrosion)
4. The cooled freshwater circuit is distributed using separate pumps to supply air conditioning and refrigeration to hotel villas, restaurants, kitchens, spa, staff residences and other areas
5. Seawater, now between 12 and 13 degrees Celsius, is returned to the ocean at a shallow depth of 40 meters to reduce impacts on the ecosystem

Benefits

- Seawater is an inexhaustible and free natural resource readily available for many island resorts
- The system can efficiently generate air conditioning and refrigeration
- It is an environmentally friendly and CFC-free alternative to conventional cooling systems
- It reduces electricity consumption for air conditioning and cooling by almost 90% compared to conventional cooling systems
- Although the initial investment cost was extremely high (USD 7.9 million compared to a traditional air conditioning system that might cost USD 1.5 million), it qualifies as a renewable energy, enabling the group to obtain a 35% tax credit from the French Polynesian government (USD 2.765 million)
- The system reduces the resort's energy load by 2.5 million litres of fuel oil imports per year, with an estimated savings of approximately USD 720,000 per year
- Despite the cost difference, the payback period is only 5 years with significant savings each year thereafter.
- The environmental savings are also significant, and reduces the resort's carbon footprint by 2,500 tons of carbon dioxide emissions per year

SEA WATER AIR CONDITIONING



Electricity costs are 1/10 that of conventional A/C systems significantly reducing operating costs

Limitations

Although SWAC relies on a simple system, several considerations impact its feasibility. The following limitations are some reasons why SWAC has not been feasible in other properties owned by TBSA.

Ideal for locations located within proximity to very deep nearshore waters

Although SWAC uses capillary pressure to draw water from the deep sea, pumps are required to draw water onshore. For InterContinental Bora Bora, a 13 kilowatt pump draws water 50 meters to the hotel. In contrast, the group's new resort, The Brando, will cost approximately 50% more and require larger pumps due to the distance of 600 meters from the continental shelf.

Requires high initial investments

Although SWAC saves a significant amount of energy, the installation cost is extremely high and subsidies are generally unavailable. As such, this system is mostly feasible in areas with high energy costs. Although electricity is partially subsidised by the French government, electricity in French Polynesia is one of the most expensive in the world at approximately USD 0.48 per kilowatt hour.

Requires extensive research for each unique site

Although TBSA completed two years of research for the installation of SWAC at InterContinental Resort Bora Bora & Thalasso Spa, the findings are not applicable to other sites having different environmental factors including oceanic geology, distance, biodiversity or currents impacting its viability.

Easier to apply in new build projects

The cost of retrofitting existing resorts is complex, requiring high investment costs. As a result, the group has not installed SWAC at any existing resorts.

Feasibility improves when excess cooling can be sold

In this application, the system was built to support more than one resort. However the lack of interest from neighbouring resorts results in overcapacity of cool air for the InterContinental and a longer payback period.

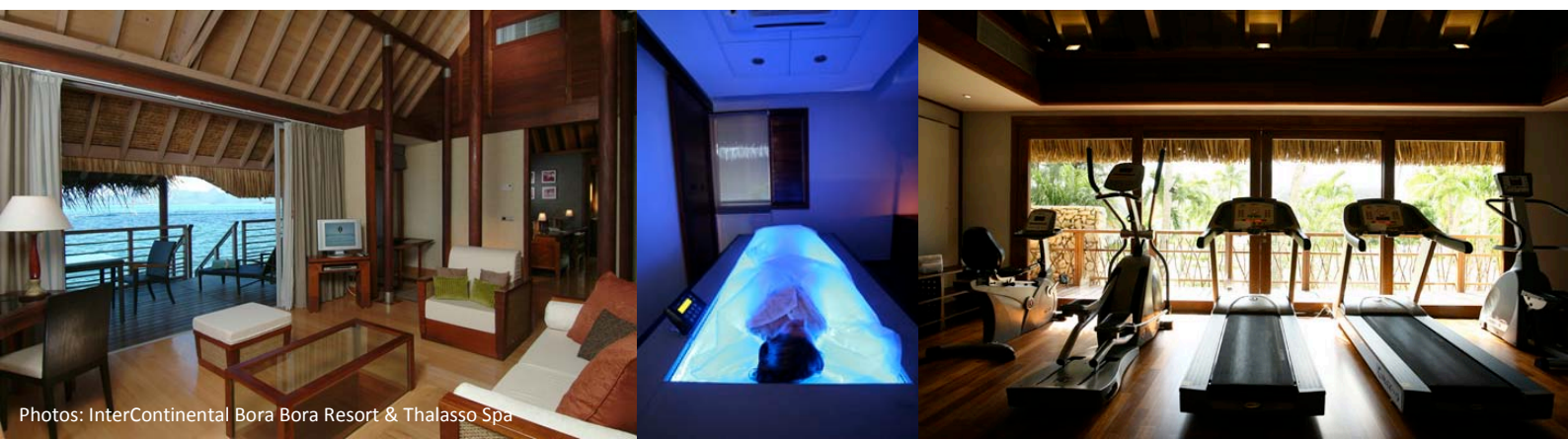
SWAC in Other Applications

Deep Ocean Spa at InterContinental Resort Bora Bora

Thalassotherapy uses high mineral content seawater in spa treatments. Although several thalassotherapy spas exist in Europe and Africa, the resort's thalassotherapy spa is the first in the South Pacific and the only establishment in the world to use seawater drawn from a depth of 900 meters. The use of this resource in the spa creates a unique facility and point of differentiation for the resort.

Lake Water Cooling

Similar cooling systems can be used inland where large bodies of water with cold water supplies exist. Examples include Toronto and Ithaca in upstate New York, where successful applications of lake water air conditioning are used.



Photos: InterContinental Bora Bora Resort & Thalasso Spa

Other Measures

As the first property built under new ownership, this resort incorporated several energy and water efficient systems.

Energy Efficient Practices

SWAC for air conditioning and refrigeration greatly reduces energy use of the resort. *Limitations: Although there are significant savings by eliminating a cooling mechanism, SWAC still requires two sets of pumps to draw water from depth to the resort, and a larger system pumping chilled water through a secondary circuit through the resort. Challenges: In this property, the cold air capacity exceeds the requirements of the resort. As such, the resort unnecessarily cools and refrigerates areas including all back of house areas and kitchens.*

8 to 10 watt LED lights were installed upon opening instead of using 60 watt incandescent bulbs. *Limitations: LED lights are significantly more expensive in French Polynesia than other countries due to low demand and import taxes.*

Villas with better insulation than existing resorts reduce the amount of air conditioning loss or heat entry.

Sensors automatically shut off air conditioning when sliding doors are left open for extended periods.

New photovoltaic panels heat water for staff residences. *Challenges: Solar panels are expensive and have a long payback period despite available subsidies. Cost savings are currently unknown due to the lack of meters.*

Water Savings

Xeriscaping practices include use of native plants, grey water irrigation, mulch from garden waste, and a drip irrigation system with a sensor to control watering needs.

Dual flush toilets, low flow taps and push valves

Rainwater tank for supplemental irrigation needs. *Limitations: Large reservoirs are not used due to land restrictions and issues related to mosquitoes. Unlike InterContinental Moorea which recently built a well to supply 70-80% of the resort's water needs, the site for InterContinental Thalasso has an unsuitable water table supply to support the resort.*

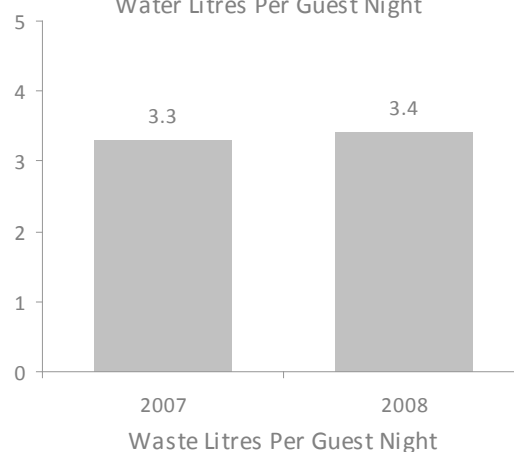
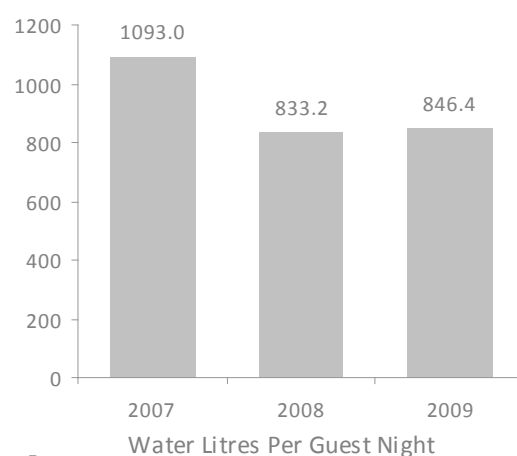
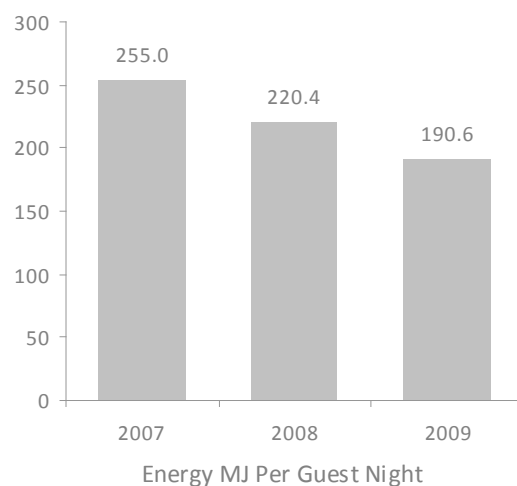
Waste

The resort has instituted recycling programs that separate cardboard/paper, plastics, glass and garden waste and will introduce in-room recycling bins. *Challenges: Although the resort separates its waste, its municipality lacks a proper waste management program. Despite this, the resort continues to separate recyclables in preparation for when the government has systems in place and mandates recycling.*

Garden waste, cardboard and paper are shredded and used for mulch in gardens and used kitchen oil is sold to refineries in Bora Bora.

Environmental Awareness

Guests can participate in stingray feedings allowing staff to keep track of stingray populations around the resort for Te Mana O Te Moana. The resort also has a coral transplantation project that experiments with growing coral in the lagoon at the resort. The growth of healthy coral improves the biodiversity around the resort the fish populations and ultimately the snorkelling experience for guests.



Data: 2007-2008 EarthCheck,
2009 figures estimated by Horwath HTL

“In the future, customers should be able to make the right choices without making huge sacrifices to comfort.”

Richard Bailey, CEO & Chairman, PBSC

OTHER INITIATIVES – Think Global Act Local

Despite having shared ownership, each of the group’s six resorts and various organizations must address sustainability based on business needs, site restrictions, suitability and financial benefits. This section demonstrates how sustainability measures can be adapted accordingly.

InterContinental Moorea

Built more than 20 years ago, InterContinental Moorea has undergone renovations to upgrade its facilities while improving energy, water and waste efficiency. Limitations on its existing structure restrict the feasibility of SWAC, while other initiatives including solar energy are currently being considered.

Energy Efficient Practices

- When rooms were upgraded with air conditioning, drop ceilings were installed under thatched roofs to prevent cool air leaks while sensors automatically switch off air conditioning when doors are left open
- 8-10 watt LED bulbs have already replaced 80% of the 60 watt bulbs in the hotel
- Linens are air dried and folded instead of being machine dried and ironed
- New pumps replace inefficient machinery in the waste water treatment plant

Combined projects reduce the resort’s energy bill by approximately 35% or USD 336,000 per year

Water Savings

Xeriscaping practices include use of native plants, grey water for irrigation, mulch from garden waste, and a subsurface drip irrigation system preventing evaporation.

Dual flush toilets, low flow taps and push valves in the back of house.

A new on-site well supplies 70-80% of the resort’s water needs. Despite the addition of two new pools and 17 plunge pools for garden bungalows, an on-site well reduces the annual water bill by approximately 40% or USD 20,400. The well, which cost USD 50,000, has a payback period of approximately 2.5 years.

Waste Management

A garden shredder purchased for USD 50,000 shreds garden waste, cardboard and paper into mulch, reducing waste removal fees by approximately USD 25,000 per year. Mulch also reduces the amount of soil and fertilisers needed and the amount of evaporation from the drip irrigation system.

In-room recycling bins will be introduced to further improve recycling.



Marine Conservation - Moorea Dolphin Centre & Te Mana O Te Moana

PBSC is a majority shareholder in the Moorea Dolphin Centre located at InterContinental Moorea. This is the only centre providing first hand dolphin experiences to guests visiting Moorea Island. With this advantage, the centre is able to donate more than USD 250,000 of its profits per year to environmental causes, research efforts and education programs reaching more than 26,000 students in French Polynesia. Partial profits also support Te Mana O Te Moana.

Te Mana O Te Moana is a non-profit organization founded by PBSC in 2004 focused on marine conservation, education and research with government approved teaching materials and programs reaching approximately 700,000 students per year across 24 islands in French Polynesia. Programs include student led sea turtle releases, beach clean ups and other activities across the country while the sea turtle clinic at InterContinental Moorea is used as a learning centre for schoolchildren and resort guests.

Success Factors

Conservation programs built primarily as marketing tools often have difficulty gaining credibility and can adversely impacts an organization. To avoid such risks, the following success factors should be considered.

Dedication and financial support to develop programs take long periods of time to initiate

The foundation started with financial support from PBSC and profits from the Moorea Dolphin Centre and grew with the dedication of its veterinarian and education resource advisor. Its strong reputation now attracts additional funding each year from private organizations and the local government.

Focus on educating children who have the greatest influence on the future of the environment

Children are open to learning about the environment and inclined to adopt environmentally friendly practices with regard to energy, water, waste and environmental protection.

Develop strategic partnerships

By creating partnerships with the government and Ministry of Education, all program materials are state approved allowing teachers to easily incorporate them into the school curriculum. Partnerships with other accredited institutions provide additional financial and research support and add credibility to the foundation.

Programs need to be accessible to the wider population

Private funding allows the foundation to provide materials free of charge to schools in outlying islands having financial limitations. Student materials are also translated into French and Tahitian.

Use local culture and circumstances to make comprehensible connections

By using existing situations in French Polynesia, schoolchildren better understand how unsustainable practices have chain reactions on the local environment, its biodiversity and their culture.

Inclusion of key projects acceptable by locals

Widely acceptable programs like beach cleanups and student led activities give the foundation credibility to introduce controversial programs affecting the cultural practices of the local community. Although sea turtles are still eaten in French Polynesia, the foundation's reputation facilitates its sea turtle conservation programs.

Train locals to work within the organization or to be local ambassadors

The foundation relies heavily on local ambassadors who have stronger influences on the local community. The long term goal is to train locals to fully embrace the administration of the foundation.



INTERCONTINENTAL BORA BORA RESORT & THALASSO SPA: BUSINESS CASE OVERVIEW

Key Takeaways

Hotels and resorts should assess individual business needs and the local environment to adopt sustainability measures adapted into their business model. The InterContinental Bora Bora Resort uses free and readily available deep seawater to produce all cooling and refrigeration requirements for the resort and the InterContinental Moorea uses local plants, an on-site well and xeriscaping practices to reduce water use.

Cost Savings

In areas where energy prices are rising, significant cost savings associated with energy, water and waste efficient systems can be achieved. Although SWAC requires pumps to distribute cold water throughout the resort, the elimination of a cooling mechanism for all air conditioning and refrigeration needs reduces the energy bill by an estimated 40% or approximately USD 600,000 per year compared to comparable resorts in the area.

What Doesn't Work

Regulatory obstacles can limit the capability for the private sector to implement certain measures technologically available and environmentally and economically sound. Solar panels can be installed at InterContinental Tahiti, but unless excess electricity can be sold back to the grid, the return on investment decreases. In addition, inconsistent waste management policies do not include sound recycling practices.

Why They Do It?

In addition to being environmentally sensible, SWAC offers long term savings in an environment where energy prices continue to rise. Additional measures to reduce energy, water and waste or protect the environment through conservation programs are instituted to protect the sensitive environment and resorts' greatest asset.

Acknowledgements:

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Laure Salabert, Chief Concierge

Louise Hamza, Sustainability Trainee

Yannick Lecoq, Executive Chef

Nathalie Poncet, Food and Beverage Manager

InterContinental Tahiti Resort and Spa

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Thierry Brovelli, InterContinental Moorea, General Manager

Catherine Savatier, Maitai Bora Bora, General Manager

Cécile Gaspar, Te Mana O Te Moana, President

Vie Jourdan, Te Mana O Te Moana, Education Resource Advisor

Yann Panheleux, Moorea Dolphin Center, Animal Director

OBEROI UDAIVILĀS

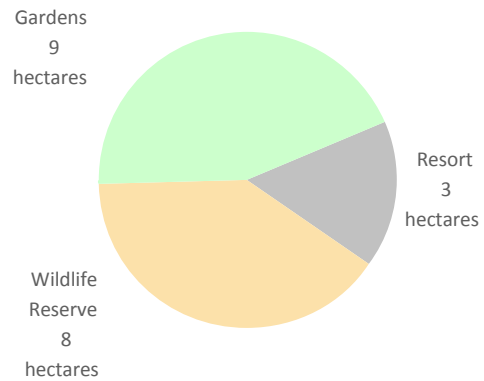
Owned and managed by Oberoi Hotels and Resorts
Udaipur 313001, Rajasthan, India
87 rooms
Opened in 2002

The Oberoi Udaivilās is located on a 20 hectare site on the west bank of the Lake Pichola facing the City Palace and Lake Resort (Jag Niwas). While it would have been easy to maximise use of the site to build a large scale development, Oberoi Hotels and Resorts carefully conceptualised the resort to preserve the site, honour cultural integrity of the area, and include environmental sustainability practices that would improve the self-sufficiency of the development. The result of twelve years of design and development is a resort that resembles a traditional Indian palace with courtyards, manicured gardens, reflecting pools, and fountains, but also incorporates modern day sustainable practices such as solar energy, rain water harvesting and a wastewater treatment plant.



ENVIRONMENTAL, WILDLIFE & CULTURAL CONSERVATION

The resort once had populations of panthers and tigers and is known to be the starting point from which Indian royalty began their hunting expeditions. Although populations of these animals have since been lost, two historical buildings that were used by the Rajas still remain and have been preserved by the resort. With rich environmental and cultural heritage in the region, Oberoi Udaivilās has incorporated the following conservation programs to preserve the image of Udaipur.



Environmental and Wildlife Conservation

- Although the total site area is 20 hectares, the resort is only built on 3 hectares or 16% of the site. The low density protects the site from overdevelopment.
- Of the remaining 17 hectares, 8 hectares are set aside for a protected wildlife reserve that is managed by the resort with the permission of the Central Zoo Authority of India. Animals include spotted deer, wild boars, rabbits, and peacocks with dedicated staff and a veterinarian. To control the population and avoid strains on the ecosystem, the resort relocates some animals to other wildlife reserves in India. Guests can watch daily feedings from the resort.
- Where possible the resort is built around existing neem and babool trees.
- The resort has a low height restriction and follows the natural terrain of the land. Although this was not mandated, the low height structures preserve the cityscape of Udaipur. Although the resort is technically one floor, the variations in elevation from the hilly terrain give it a sense of height and depth.
- The resort has a setback of 45 meters from the lake. Although this was not mandated, the setback protects the lake side and prevents erosion.

Cultural Conservation

- The resort was built to resemble an Indian palace in the Rajasthan region of India to complement the architecture of historical buildings including the City Palace
- The architectural integrity of the resort in all aspects of exterior, interior and landscape design improves its destination appeal and does not pose any negative impacts on the historical and cultural image of Udaipur
- 2 historical buildings that were once used by Rajas during their hunting expeditions have been restored and are protected by the resort. Bada Mahal is 150 years old and Chota Mahal is 200 years old. Bada Mahal also has a small coliseum where Rajas were able to watch tiger and wild boar fights. Guests are invited to explore these buildings and view animal feedings in the wildlife reserve from Bada Mahal.
- Local artisans are used to create traditional artwork, and perform traditional dance and other activities.



SUSTAINABLE DESIGN

Although a modern day approach to construction could have been cost and time efficient, the resort incorporated traditional building methods to preserve local culture and enhance destination appeal.

Building Design

- A mixture of indoor and outdoor spaces creates a natural flow of air that cool interior spaces
- Open air corridors with natural light and ventilation use less energy than enclosed corridors
- Topography and building height are used to naturally channel rainwater flow towards the water table via rooftop catchments and gravity

Building Materials

- Natural materials were used as much as possible
- Locally sourced materials include green marble, sandstone and woods
- Double glazed windows and a thick cement roof further insulate the resort
- Instead of using volatile organic compound (VOC) emitting paint, the resort uses a traditional and natural lime wash for all of its interior and exterior walls which are estimated to exceed 46,500 square meters. Because walls require annual repainting, this practice is less environmentally damaging but incurs additional labour costs - an important and interesting trade off for the property. In addition, the local lime wash is 70 to 75% cheaper than paint and supports local businesses.

Challenges: Costs benefits of these commitments have not been recorded and therefore it is not possible to say whether there are net financial environmental gains.

LOCAL PURCHASING

To reduce greenhouse gas emissions associated with transportation of food and to support the local economy, the resort has implemented the following purchasing practices.

- Many vegetables and spices are grown on site in the resort's nursery
- The resort is currently building its own greenhouse to grow produce year round
- Where possible, local or regional substitutes that do not compromise on taste or quality are used
- To increase the variety of locally available fruit and vegetables, a partnership with agricultural universities in the area will provide local farmers with seeds and assistance with irrigation practices
- The resort makes its own drinking water and ice via a reverse osmosis process
- Bottled drinking water is made domestically at a centralised facility by Oberoi Hotels and Resorts for use in their hotels which reduces greenhouse gas emissions associated with water imports, and provides guests with a safe and branded alternative to other domestically bottled water
- All seafood is line caught and imported seafood items are used less frequently





Photo: Y Jong

ENERGY

Although energy in Udaipur is subsidised, the lack of sufficient energy to support the growing population results in daily controlled blackouts throughout the city. To ensure a continued supply of electricity to the resort, Udaivilās employs sustainable practices to conserve energy and reduce its reliance on diesel fuel.

- The resort has a building management system which ensures the efficient operation of chillers and temperature controls according to load demands and occupancy.
- Solar panels placed on building roof tops are used to heat the resort's pools.
- Energy efficient chillers with screw compressors are used instead of traditional reciprocating compressors.
- Waste heat is recaptured from the chillers and used to heat all domestic hot water.
- A backup diesel generator is only used for approximately one hour per day during the hot summer months when the power supply fails from the distribution company. The diesel generator is contained in a room that reduces noise pollution to the outdoors.
- In 2010, the resort will install new boilers that will still require diesel, but will operate more efficiently and will have a system to capture return steam to heat pools and domestic water. Although the savings and fuel efficiency associated with the new boilers and associated supplies, which will cost USD 300,000, are currently unknown, they are expected to reduce the resort's reliance on conventional energy resources.
- Udaivilās will convert its 560 garden lights from CFL bulbs to energy efficient and long lasting LED bulbs. The bulbs, which are expected to require an investment of USD 17,000, will have a payback period of 2.5 years, will require less maintenance, and do not contain toxic mercury found in CFL bulbs.
- The resort is also considering more efficient chillers. If this is done, the amount of waste heat that can be recaptured for domestic hot water will also be reduced. To compensate for this, the resort is installing additional solar panels to heat domestic hot water for the resort.

WATER

Rajasthan is an extremely arid state, much of which is essentially desert with the exception of areas like Udaipur which are surrounded by mountain ranges that act as natural rainwater catchments. Although manmade lakes are generally full until the end of April and regenerated during the summer, unseasonably dry monsoon seasons, changes in mountain topography from over mining impacting rainfall patterns, and the growing population are taking a significant toll on the water supply. Instead of seeing majestic lakes year round, visitors occasionally see dry lake basins used as pastures for livestock, playgrounds for children or areas where villagers leave terracotta water pots as prayers for rainfall.

Although the government has built three dams from peripheral lakes to maintain supplies within the city, this temporary solution fails to address the long term issue related to dry monsoon seasons. The negative impacts not only affect tourism to Udaipur which is known as the “city of lakes”, but will also affect the wellbeing of its growing population and potential for further development. To minimise the resort’s use of the municipal water supply and improve its self sufficiency, it has implemented sustainable measures.

Supply

- Site topography and building elevations aide in the harvesting of rainwater from rooftops and public areas
- 9 bore wells are used to pump water to holding tanks
- A reverse osmosis system purifies water for all domestic use, for the resort’s 9 pools, ice and drinking water in the restaurant for breakfast built at a cost of USD 80,000.
- Recycled water is used to water the landscape instead of using fresh water supplies

Water Use Minimization

- Staff training encourages employees to reduce water use and report leaks where possible
- Bathroom fixtures include low flow toilets and low flow shower heads

Waste Water Treatment and Reuse

- A wastewater treatment plant recycles water for garden irrigation and eliminates waste water discharge
- A new sewage treatment plant will further improve the quality of water being used in garden irrigation. Although this requires an investment of USD 160,000 and provides no financial benefit to the resort, it will ultimately improve the quality of the water table supply.

Many of these systems have no direct benefit to guests or staff and are capital intensive to install. In addition, the cost of municipal water and subsidised energy do not offer attractive returns on investment for the resort. However, Oberoi must ensure an uninterrupted supply of water and energy to its property to maintain a luxury product that attracts guests. While these initiatives are made as a means to reduce the resort’s environmental impact, they are also required for business practicality.

WASTE

Methods to reduce solid landfill waste produced by the resort include the following:

- Solid waste from the sewage treatment plant is dried and used as fertiliser in the gardens
- Garden waste is composted for garden fertiliser
- Plastics, glass and metal cans from the kitchen are recycled
- Waste oil from kitchens is given to outside agencies for the manufacturing of washing soaps/detergents

“Luxury nowadays is no longer only about opulence”
Torsten Van Dullemen, General Manager

THE OBEROI UDAIVILĀS: BUSINESS CASE OVERVIEW

Key Takeaways

Cultural and natural resource conservation can be a critical success factor for resorts located in environmentally or culturally rich destinations. The preservation of the site and incorporation of historical architecture and art forms in Udaivilās improves the resort’s destination appeal, which is necessary in the current competitive market and for the future sustainability of Udaipur.

Implementing environmentally sustainable business practices can serve as a business necessity that addresses supply limitations on natural resources and the future impact that climate change may have on tourism. Limited energy and water supplies in Udaipur pose current operating limitations on hotels, but if left unaddressed will have long term negative impacts on tourism in Udaipur.

What Works and What Doesn’t

Although the implementation of sustainability programs can reduce the resort’s impact on the environment, the subsidised energy and free water supplies in India often result in little to no financial benefits to hotels. In addition, the lack of consistent monitoring makes it difficult to measure historical patterns of resource use or financial benefits.

Why They Do It?

Although use of modern construction methods and conventional equipment can be time efficient and cost effective, Udaivilās was built to improve the long term sustainability of the resort and attractiveness of Udaipur. Although these efforts often go unnoticed by guests, they will improve the long term viability of the resort in an environment that is being affected by poor resource management and climate change.

Acknowledgements:

The Oberoi Udaivilās

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Neelima Chopra, EIH Limited, Executive Vice President Sales & Marketing

OUR NATIVE VILLAGE

Independently Owned and Managed
Hessargatta Village, Bangalore, India
24 rooms
Opened in 2006

In 1990 CB Ramkumar purchased a modest 1.8 hectare lot for his father-in-law to start a hobby farm in Hessargatta village, 50 kilometers north of Bangalore. Over years the farm expanded to 4.85 hectares and produced a wide variety of vegetables and fruit sold in local markets. Although crop varieties changed by season, yields were often inconsistent due to insufficient rain and grid energy required to pump water from the water table. When the farm ceased active farming in 2001, the family recognised that to do anything substantial with the land, it would have to be completely self-sufficient in terms of energy and water.

In 2006 the family opened Our Native Village, a 24-room holistic resort for guests to nurture their mind, body and soul to promote a healthy lifestyle. Although they recognised that holistic programs would be the primary demand generators for the resort, the development of a self-sufficient eco resort with few impacts on the environment would not only complement the holistic concept, but resonate with the family's own principles.

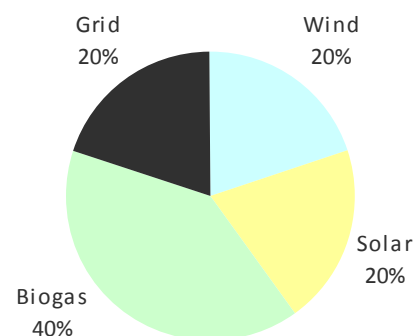
Without prior hospitality experience, the approach to a fully sustainable product was to address what they believed were the **5 pillars of sustainability: energy, water, waste, architecture and the food chain**. Although each factor was taken into consideration, energy and water were the largest areas of concern and the resources without which the resort could not operate. To address issues of limited water and energy supplies, the family employed professional consultants to complete microclimate and hydro geological surveys to assess the potential for self-sufficiency.



ENERGY

Energy use at Our Native Village is limited due to its use of open-air spaces, natural light, passive cooling, proper insulation, and location on high ground providing a natural breeze. In addition, the absence of high energy consuming electrical amenities including air conditioning, televisions, hairdryers and minibars further saves on additional energy requirements.

Although Our Native Village could install a diesel generator for a continuous energy supply, diesel does not address the issues of fossil fuel use, greenhouse gas emissions, and rising energy costs. A microclimate survey identified alternatives appropriate for the site, allowing the resort to reduce its reliance on a single energy source by diversifying its options. The survey was addressed the following:



Q – How much wind and sun is available on the site?

Q – How much energy is required to support a resort with 100 people per day?

Q – How much gas would be necessary to support the kitchen requirements for the resort?

Q – What additional backup systems would be required?

Powered By Nature

1 Wind Turbine with a capacity of 3.3 KVA

The wind turbine generates energy when wind is at a minimum of 20 kilometers per hour. When excessively high winds prevail, the blades automatically turn away from the wind to slow the blades. Alternatively, a manual break can be used when winds are too strong. Generated energy is stored in a battery bank. The wind turbine cost USD 12,500 and generates approximately 20% of the resort's electricity.

Limitations: Wind turbines are only feasible in areas with sufficient wind, land and planning permission. A microclimate assessment is necessary to establish suitable locations and heights to utilise the best wind energy.

80 Photovoltaic Solar Panels with a capacity of 6.3 KVA

The photovoltaic solar panels are used to heat water for the resort. Excess energy is stored in a battery bank. The photovoltaic cells cost USD 42,500 and generate approximately 20% of the resort's electricity.

Limitations: Solar energy is only viable where there is suitable land or surface area and sun. It is also only generated during the daytime and power generation is limited on cloudy and rainy days.

2 Biogas Domes and Biogas Generator

Underground biogas digesters are fed with cow dung, kitchen waste, and de-oiled cakes that are a waste by-product from the non-edible oil seed industry. Over time, methane is formed and channelled directly to the kitchen for cooking gas. Excess biogas is converted to electricity with an on-site biogas generator with the electricity stored in a battery bank. Left over slurry is converted into organic fertiliser and used in the farm.

By using kitchen waste, cow dung and de-oiled cakes, the resort reduces waste production and creates low cost biogas, electricity and garden fertiliser. The biogas domes currently generate 70% of the gas required in the kitchen and 40% of the energy for the resort. Each biogas dome costs USD 425 and requires 80 kilograms of de-oiled cakes per day which costs USD 10. Annual savings is estimated to be 60% compared to regular LPG usage.

Challenges: Without consultants in the region, Our Native Village lacked the knowledge to build proper storage facilities. Although their storage system initially worked, the lack of compartmentalization resulted in a loss of stored biogas when one leak developed. By consulting professionals, this mistake could have been avoided.

Limitations: If the supply of the fuel source is insufficient or rises in cost, the viability of the biogas domes can vary. Our Native Village used to pay USD 5 for 20 kilograms of de-oiled cakes per day, but currently pays double the price as their supplier has, and continues to, increase prices.

Suitability: Biogas has 25% of the calorific value of LPG. As such, food takes longer to cook. Although slow cooking is suitable for Indian cooking, it might not be suitable for other cooking methods.

Support Systems

Because the supply of wind, sun and bio-fuel can vary, the resort requires support systems to both store excess energy for later use and provide alternative fuel when supplies are low.

280 Battery Bank

A battery bank stores excess energy generated from the wind turbine, solar panels and biogas generator. Although the system cost USD 21,250, it provides backup electricity when wind and sun are not providing generating capacity.

4 Gujarat Boilers

4 Gujarat boilers are used to heat water when the hotel capacity is high or solar energy is low, presently only a few times per year. These traditional boilers are still used in villages across India and use waste wood to heat water via a convection system. Smoke from the fire rises through a copper chimney built in a steel drum casing surrounded by water, which then rises into holding tanks on building rooftops.

Benefits: The Gujarat boilers use the small amount of waste wood produced on site and old paper to heat water and reduce waste. Recycled paper is formed into a pulp and dried in blocks that are used like fire wood.

Grid Energy

Although the resort generates much of its own energy supply, it still relies on the municipal supply for 3-phase energy to power water pumps and refrigerators.

Towards a Future of Self-Sufficiency

The resort is currently exploring ways to completely eliminate the resort's use of energy from the grid.

Biogas conversion into a sewage treatment plant

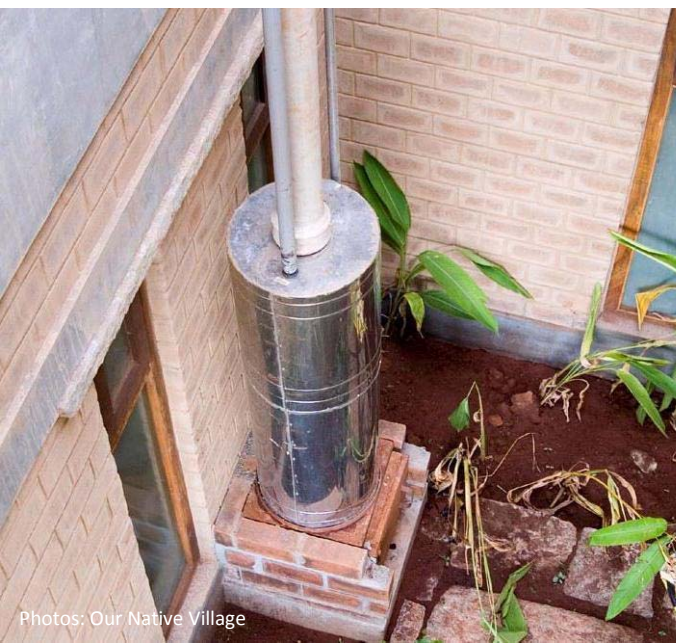
The conversion of the biogas plant into a complete sewage treatment plant can process cow dung, kitchen waste and human waste into methane for the kitchen, with leftover slurry is used as fertiliser.

Parabolic Solar Panels

Parabolic solar panels intensify the amount of solar energy generated to a concentrated point. The steam from this system can be used for steam cooking in the kitchen without need for biogas or methane.

Solar Thermal Plant

A solar thermal plant heats water and forms stored steam that continually heats water through turbines. This system is preferred over solar panels because solar energy is only produced when the sun is available. With a solar thermal plant, stored steam continues to generate energy after sunset.

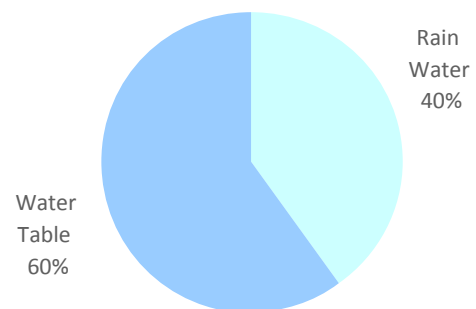


*“The dream for us is to develop a 100% sustainable eco system –
one that can be replicated in society in general”
CB Ramkumar, Owner, Our Native Village*

WATER

A hydro geological survey assessed limitations with regard to an inconsistent water supply at the resort.

- Q – How much rain does the area receive?
- Q – How much water is needed to support 100 people per day?
- Q – Is ground water quality suitable for reverse osmosis?



Water Supply

To ensure a sufficient water supply, the following action plans were implemented to harvest as much rainfall and recharge the water table when possible.

- Rainwater catchments are available on all rooftops and funnel harvested water through a network of underground pipes to the resort's 84,000 litre rainwater tank.
- When rainwater supplies are low, water is pumped from the water table through bore wells. To ensure a sufficient water table supply, 5 rainwater recharge wells throughout the resort channel rainwater to regenerate the water table. In addition, grey water from taps and showers is filtered through natural reed beds before regenerating the water table. The result provides sufficient water table supply and zero waste water discharge from the resort.

Water Use

The resort uses minimal amounts of water compared to many resorts that have several pools or exotic gardens which require large amounts of water. To reduce water use, the following areas are considered:

- The landscape consists of native plants which do not require supplemental watering.
- Guest bathrooms have dual flush toilets and no bathtubs which reduces water use by guests.
- A reverse osmosis system is an efficient way to produce potable water on site which reduces plastic waste.

Waste Water

Use of recycled waste water eliminates waste water discharge and recharges the water table.

- Grey water is naturally filtered through reed beds to remove impurities before seeping to the water table.
- Kitchen waste water and waste water vacuumed during the process of pool cleaning are used for farm irrigation. A basic subsurface irrigation system reduces potential evaporation loss.
- Sewage water is discharged into the resort's twin leach pit tanks producing fertiliser.

“We must be responsible for our own waste”
CB Ramkumar, Owner, Our Native Village

WASTE

By using time tested practices that process and reuse all waste, Our Native Village produces very little landfill waste. Such practices are still used in surrounding villages and rural areas worldwide and are easily adaptable to rural and urban environments.

Waste Minimization

Like Six Senses properties that try to minimise waste, Our Native Village has implemented the following programs to reduce waste production.

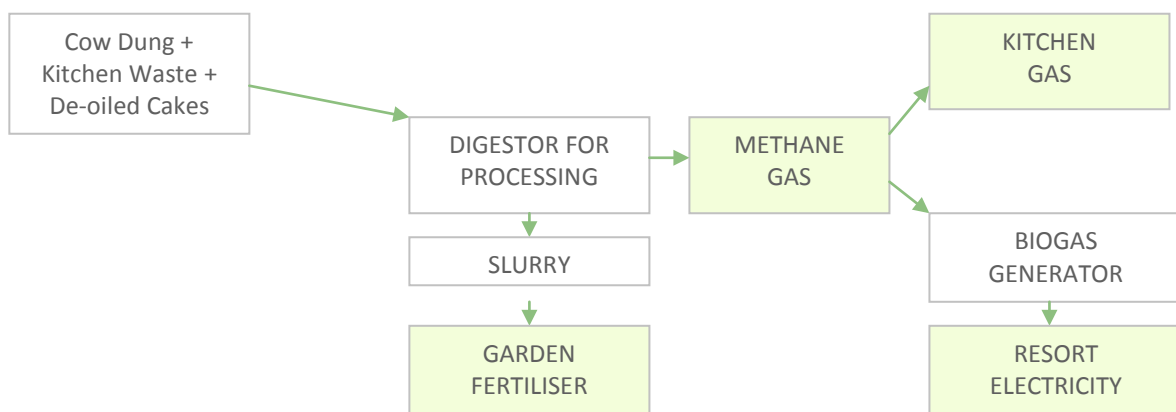
- The on-site garden for most restaurant produce reduces potential packaging waste associated with outside purchasing
- The production of potable drinking water on site reduces plastic waste
- The resort provides shampoo and conditioner in refillable terracotta clay bottles
- All shampoos and soaps are natural, 100% biodegradable and locally made in India. Natural materials include wood ash and soap nut powder.
- Deliveries of purchased produce and goods from local suppliers are often packaged in reusable and biodegradable packaging

Waste Management – Minimal landfill waste

Proper management of all waste results in minimal landfill waste for the resort.

- Organic kitchen waste and cow dung are used in the biogas dome to create biogas, energy and fertiliser.
Limitations: Practical for hotels that have land and access to the fuel source required for a biogas dome
- Waste from toilets is put through underground septic tanks that convert waste into usable fertiliser
Limitations: Practical for sites that have sufficient land for equipment installation
- Plastics and glass items are recycled through the municipal recycling centres
Limitations: Some municipalities do not have available recycling banks
- Grey water is used to recharge the water table
Limitations: The quality of waste water can have negative impacts on the environment. For Our Native Village, the lack of chemicals and toxic cleaning agents ensure that grey water has minimal impacts.
- Paper is made into a pulp before being formed into balls that are sun baked, stored and used like wood for burning in bonfires or in the Gujarat boilers that heat water when solar power is low.

From Waste to Biogas and Electricity



ARCHITECTURE – Low impact design and construction

Sustainable design and construction at Our Native Village ensure the resort has low environmental impacts.

Site Selection

- Although the original design sited the resort in a low lying area that was not being used for farmland, an assessment of the site's topography revealed that siting the resort on high ground would maximise the topography to channel rainwater to rainwater tanks and the water table via gravity
- Because of the elevation, the resort always experiences a slight wind that naturally cools the resort
- 3 hectares of the farm was preserved and is still used to farm organic produce for the resort.

Design Strategies

- All bricks were handmade on site from the clay that was excavated for the building foundations. Clay was mixed with 5% cement and 5% quarry dust and bricks were sun dried for 9 days before being used in construction. Making the bricks on site resulted in zero greenhouse gas emissions related to the production and transportation of these building materials.
- Stone and wood were locally sourced to reduce greenhouse gas emissions associated with transportation.
- All wood was left untreated to eliminate use of high-VOC-emitting and toxic materials
Challenges: Untreated wood is susceptible to rotting and needs frequent replacement.
- All rooms are oriented westward. Use of wide windows in the west and narrow windows in the east funnel air through guestrooms to maximise ventilation and eliminate the need for air conditioning.
- An open air dining area uses natural light and ventilation
- The resort employed local builders to construct the resort, which took only 8 months to build.
- 6 teams of tribal/rural artists were hired to paint traditional murals with homemade dyes in each guestroom. Although these are dying art forms, their use in the resort helps to preserve local culture.
- All terracotta in the resort for bottles, cups, water jugs and dust bins are made by a local village potter
- An all natural pool which is maintained like a pond with reeds eliminates the need for chlorine and creates an ecosystem for plants, birds and other animals

Landscaping Strategies

Native landscaping reduces the water and maintenance needed for survival of non native species. In addition, over 90 traditional medicinal plants are found around the resort for guests to learn about and sample.

THE NATURAL SWIMMING POOL

The resort's manmade pool is a 100% natural swimming pool that uses aquatic plants that absorb nutrients, maintain water quality and create a natural swimming environment. The result is a clean and clear pool that does not require chlorine or other chemicals to remain clean. Regular cleaning is still required as part of general maintenance to remove debris, however waste water that is vacuumed in the cleaning process is reused for farm irrigation.



Photos: Y Jong, Our Native Village



FOOD CHAIN

Our Native Village serves an organic menu that is meat, dairy and alcohol free to complement the holistic health and wellness experience for guests. A slow cooking method which efficiently uses the biogas produces flavourful foods that are healthy and provide balanced diets for guests.

On-Site Organic Farm

The resort's 3 hectare farm produces seasonal vegetables and fruit year round without chemical fertilisers or pesticides. Crop yields vary by season with excess supply sold in the local markets.

Herbal and Medicinal Plants

The resort has over 90 species of herbal and medicinal plants growing throughout the gardens.

Purchased Foods

The resort purchases the following organic foods from nearby sources in India.

- Staples including rice, flour, spices, salt, etc.
- Fruit and produce that is out of season in Bangalore
- Bottled water for guests who request it

For the most part, procured foods are available within 50 kilometers from the resort

COMMUNITY

With more than 60% of the resort's employees hired from local villages and another 30% hired from cities throughout India, there is a strong sense of village community within the resort. The resort also encourages guests to interact with the employees and villagers throughout their stay by providing opportunities to learn about traditional village games, art forms, music, farming practices and rituals. These activities enhance the sense of destination for guests, and also promote and preserve traditions that are important to the local community. Much like the Schoolhouse in Beijing, the sense of community and local hiring practices results in employee pride and higher employee retention.

The resort has also established a foundation called FEEL (Foundation to Enable Eco Living) inviting student groups to visit the resort. The purpose of the field trips is to raise environmental awareness and to introduce students to resource management techniques that can be easily duplicated in their own homes or villages.



OUR NATIVE VILLAGE: BUSINESS CASE OVERVIEW

Key Takeaways

Regardless of location, positioning and scale, all hotels have the opportunity to implement environmentally sound practices to reduce greenhouse gas emissions and costs. Our Native Village is like other hotels in its need for energy resources and consumption, but is unique in its self sufficiency and low carbon footprint.

Cost Savings

The production of renewable energy, use of rainwater tanks and complete waste management system reduces costs in an environment where declining water resources and rising energy costs create new challenges. Our Native Village generates 70 to 80% of its own energy, 70% of its own gas, produces a majority of its own produce and has a zero waste policy, all of which reduce long term operating costs.

Business Generation and Customer Loyalty

Sustainable operating practices in all aspects of energy, water, waste, architecture and food clearly demonstrate the resort's complete dedication to a holistic environment. A consistent sustainability policy can generate demand and loyalty from guests who seek products that resonate with their own values. The resort receives 30% of repeat business, and 90% of guests are recommended through word-of-mouth marketing.

Community Engagement

Community engagement can have positive impacts on the surrounding environment. Our Native Village hosts outreach programs to encourage others to implement time tested and cost effective sustainability practices.

Staff Engagement

Staff engagement can improve the workplace environment and save costs. Employees at Our Native Village participate in lifestyle activities that promote a healthy lifestyle and reduce turnover.

What Works and What Doesn't

Progressive measures can be difficult to implement and maintain without proper consultation and assistance. While many programs at the resort are implemented successfully, the lack of professional assistance has resulted in some inefficiencies that could have otherwise been avoided. In addition, the lack of monitoring makes it difficult to measure cost benefits and investment returns.

Why They Do It?

The choice to be self-sufficient at Our Native Village not only reflects personal values and sets an example for others, but is a long term solution to address issues related to depleting water supplies and rising energy costs. In addition, Our Native Village operates profitably and is expected to have a payback period of 7 years.

Acknowledgements:

Our Native Village

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Susheel Nair, Resort Manager & Reconnect Guide

Ambika Ramakrishnan, Executive Chef & Farm Manager

Lalitha Ramkumar, Our Native Village, Finance & Sales Director



WYNDHAM VACATION RESORTS

SEVEN MILE BEACH

Owned and Managed by Wyndham Vacation Resorts Asia Pacific Pty. Ltd.

78 Surf Road Seven Mile Beach, Hobart, Tasmania

61 vacation units with 129 rooms

Originally built in 1988

Redeveloped in 2005



Native Landscapes of Seven Mile Beach

Radiata Pine is native to coastal California and was introduced to Australia as an ornamental plant. With its success rate as a transplant, versatility, rapid growth and timber yields, Radiata pine has become the most common type of general purpose timber and the most widespread exotic tree in Australia.

The first commercial plantations were introduced to Tasmania in the 1930's to support the timber, pulp and paper industry. As a result, large tracts of native bush were replaced with the fast growing pine to boost the local economy and reduce the island's reliance on imported building materials. Seven Mile Beach, to the east of Hobart, was one of the designated plantation areas, and although the pine grew successfully, the infestation of a Sirex wood wasp brought an end to many of its plantations in the 1950's. Without proper maintenance, remaining plantations overgrew and created dead zones for native flora and fauna.

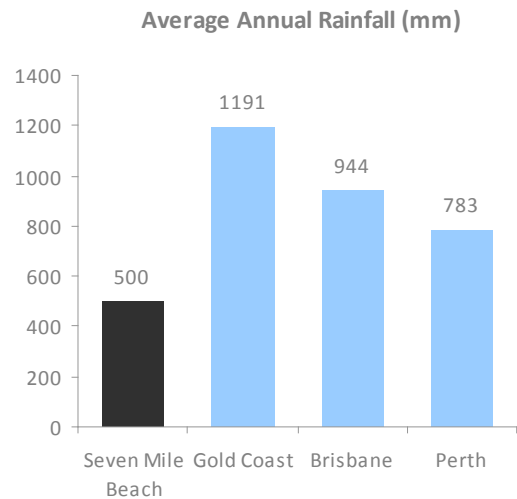
In 1988, a small area on Seven Mile Beach was cleared for the development of The Pines Resort, with 20 two-bedroom units surrounded by old pine plantations. In 2005, Wyndham Vacation Resorts Asia Pacific (WVRAP) purchased and redeveloped the property into a larger vacation resort and restored the landscape to its native bush.

“You can’t work against the environment. You have to work with it”
Derek Howe, Horticulturist, Wyndham Seven Mile Beach

Native Landscapes

Although the redevelopment included designs to build lush gardens with exotic plants, the operations team raised concerns at an early stage regarding risks associated with non-native landscaping. Not only would exotic plants be expensive to import, but also water and labour intensive, while still susceptible to low survival rates due to poor rainfall in the region. According to the Bureau of Meteorology in Australia, Hobart only received an average of 468 mm of rainfall per year in the past 3 decades. In addition, a surface irrigation system would result in high levels of evaporation that would be inefficient and costly.

Wyndham agreed to support the team’s proposal to restore the landscape to its pre-1930’s bush which would save costs, improve the area’s destination appeal and biodiversity, and create an attractive resort landscape.



Restoring the Ecosystem

The resort’s horticulturist was given freedom to design the landscaping scheme. With a limited budget, he began the careful process of collecting seeds from native plants around the region over a period of two years and germinated them on site in a purpose built nursery. To expedite the project, front desk night shift staff contributed by repotting seedlings in their downtime.

Although germinating and transplanting 28,000 plants across 14 hectares was time consuming, their efforts created a landscape that *works with nature instead of against nature*, improves the local habitat, and facilitates the growth of other native plants that had sat dormant in the soil. 5 years after initial germination, trees and plants are maturing, and various wildlife including wallabies, echidnas, blue tongue lizards and various bird species are now readily seen around the resort.



Automated Drip Irrigation and Water Treatment Systems

Benefits

- Because of an ongoing draught in Australia, watering of lawns using the municipal water supply is prohibited
- Water prices continue to increase
- A drip irrigation system directs water to roots which limits evaporation and in this case requires one-tenth the amount of water compared to an above ground irrigation system
- An automated system greatly reduces manual labour and maintenance
- Recycled waste water eliminates water costs and waste water discharge

Limitations

- During exceptionally hot seasons or low peak periods when recycled water supplies are limited, the resort still uses supplemental irrigation from the municipal water supply
- While recycled waste water can be used to irrigate grass, it cannot be used for native plants, as the phosphorous levels in waste water are too high
- By using an automated system, the resort saves up to USD 50,000 per year
- As such, the payback period 5 years with ongoing savings in annual operating costs of USD 85,000

Sample Savings for Automated Drip Irrigation and Water Treatment Systems

	Original Plan	Xeriscaping Plan
Irrigation System Equipment Installation	-	USD 58,000
Waste Water Treatment Plant Installation	-	USD 375,000
Annual Labour Cost	USD 51,400	-
Annual Water Cost from Municipal Supply	USD 35,700	USD 1,785*
Total Installation Cost	-	USD 433,000
Annual Operating Cost	USD 87,100	USD 1,785

Based on USD 1 = AUD 1.12

* Supplemental watering required in the dry season



Photos: Top: Y Jong, Bottom: WVRAP Seven Mile Beach, Y Jong

GREENER GREENS

Native landscapes like the one at WVRAP Seven Mile Beach:

- create a true sense of destination appeal
- are cheaper to source than exotic plants
- are easier to maintain since plants can naturally survive in the area's climate, soil and water conditions
- reduced need for additional irrigation (but see ** below)
- self maintain by propagating their own compost and fertiliser eliminating the use of additional chemicals or pesticides needed to keep non-native species alive
- promote biodiversity, a healthy ecosystem and improved natural habitats for native birds, insects and wildlife

XERISCAPING – Smart Landscaping Practices

Xeriscaping or xerogardening is a sustainable landscaping practice that reduces or eliminates the amount of water often used in supplemental landscape irrigation. Although this is important in drought prone areas where water supply is inadequate, techniques to reduce water use and/or waste can be implemented in gardens worldwide.

Xeriscaping techniques used at the resort include the following:

Save water and water expenses

Indigenous and drought resistant plants not requiring supplemental irrigation save water. When additional irrigation is needed, a simple subsurface drip line irrigation system ensures minimal water evaporation. Use of sloped ground, terraces, sun and shade also control draining and watering needs.

Save energy and energy expenses

A reduction of necessary maintenance for watering, mowing or trimming minimizes energy consumption.

Reduce maintenance and manpower

Without the need for supplemental irrigation and maintenance, xeriscaped gardens often self maintain.

Grey water reuse ()**

To eliminate waste water disposal, the resort has a wastewater treatment plant that feeds treated water through a subsurface irrigation system to irrigate 3 hectares of fescue grass. Although grass is not ideal in a drought prone area, it is necessary at this resort as a means to eliminate wastewater. *Limitations: Treated waste water could not be used for native plants since the phosphorous levels are too high for native plants.*

Rainwater harvesting

A dam that accesses the water table and is regenerated by rainwater acts as a backup system to feed a drip-water irrigation system for plants. Trout are placed in the dam to control mosquito larvae.

Mulching

Mulch that is created from garden waste and waste wood is used throughout the resort. In addition to aesthetic benefits, mulch prevents weeds from growing and reduces water loss from evaporation.

EDIBLE and CURATIVE LANDSCAPES

Bushfood, also referred to as bush tucker, in Australia includes native plants used for their nutritional and medicinal values. In addition to planting native plants on site, the resort also harvests 32 species of native bush tucker consumed by the aboriginal Pydairm people. The presence of bush tucker and other heirloom vegetables allows guest to learn about and sample native foods.

Examples of bush tucker found on site include the following:

***Acacia dealbata* (Silver wattle)**

Seeds are often eaten for their high carbohydrate and protein content.

***Banksia* spp**

Nectar from flower-cones are soaked in water to make sweet drinks.

***Tasmannia Lanceolata* (Mountain pepper)**

Leaves and berries are used as spice and pepper substitutes.

The plant is also known to have antimicrobial and antioxidant qualities.

***Billardiera scandens* (Apple berry)**

Long berries taste similar to apples or kiwifruit.

***Acacia melanoxylon* (Blackwood)**

Hardwood used for spears and shields while the bark can soothe stiff joints.

***Dodonaea viscosa* (Hop-bush)**

The root's juice can be used for toothaches or cuts.

Leaves and juices can also be used on stonefish and stingray stings.

***Lomandra longifolia* (Spiny-headed Mat-rush)**

Leaves used to make baskets and mats.

Flowers used to make nectar.

Tetragonia implexicoma

Native spinach – used for food

Bulbine Bulbosa

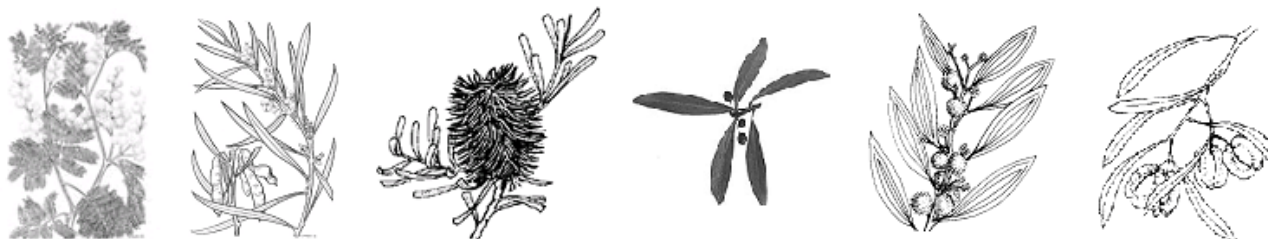
Native leek– used for food

On-Site Garden

The resort's own vegetable garden yields some of the produce used in the restaurant. By growing their own vegetables, greenhouse gas emissions from food transport are reduced.

Eco-Education Walking Tour

The resort's horticulturist offers a weekly tour through the resort to introduce guests to native plants, heirloom crops, the on-site organic produce garden and edible bush tucker. The tour currently attracts 15 to 20% of guests and concludes with a booklet given to each guest that identifies the various native species and edible plants found on site. Recipes that use native plants and vegetables are also provided.



WYNDHAM VACATION RESORTS – SEVEN MILE BEACH: BUSINESS CASE OVERVIEW

Key Takeaways

A native landscape can create destination appeal and save costs. WVRAP Seven Mile Beach restored the native landscape at a low investment, and has experienced successful growth without the maintenance costs associated with exotic gardens.

Cost Savings

In a drought prone area, plants that require extensive watering and maintenance should be avoided. Understanding the limitations of drought prone Tasmania, the resort used native plants and xeriscaping techniques to create a healthy landscape that survives without using and paying premiums on stressed water supplies. The investment of USD 433,000 saves up to USD 85,000 per year in labour and water costs.

Community Engagement

Community engagement can provide localised knowledge that can improve efficiencies and save costs. Without local knowledge from the operations team and assistance from community nurseries, the restoration of the native landscape may have suffered from low survival rates. With the knowledge they have gained, the resort works with local organizations to teach schoolchildren about the benefits of local flora. The resort also regularly donates seedlings to schools for use in their own gardens.

Industry Influence

The successful implementation and cost savings of landscaping practices at Seven Mile Beach has prompted Wyndham to consider using native landscapes for other properties where possible and relevant. Their newest resort development located in Wanaka, New Zealand also features native plant species with a particular focus on those from the immediate local region.

Why They Do It?

Landscape architects need to be aware of resource limitations and ecological impacts related to designing exotic landscapes. WVRAP Seven Mile Beach chose to restore the native landscape so that it would work with nature instead of against nature and improve the area's biodiversity.

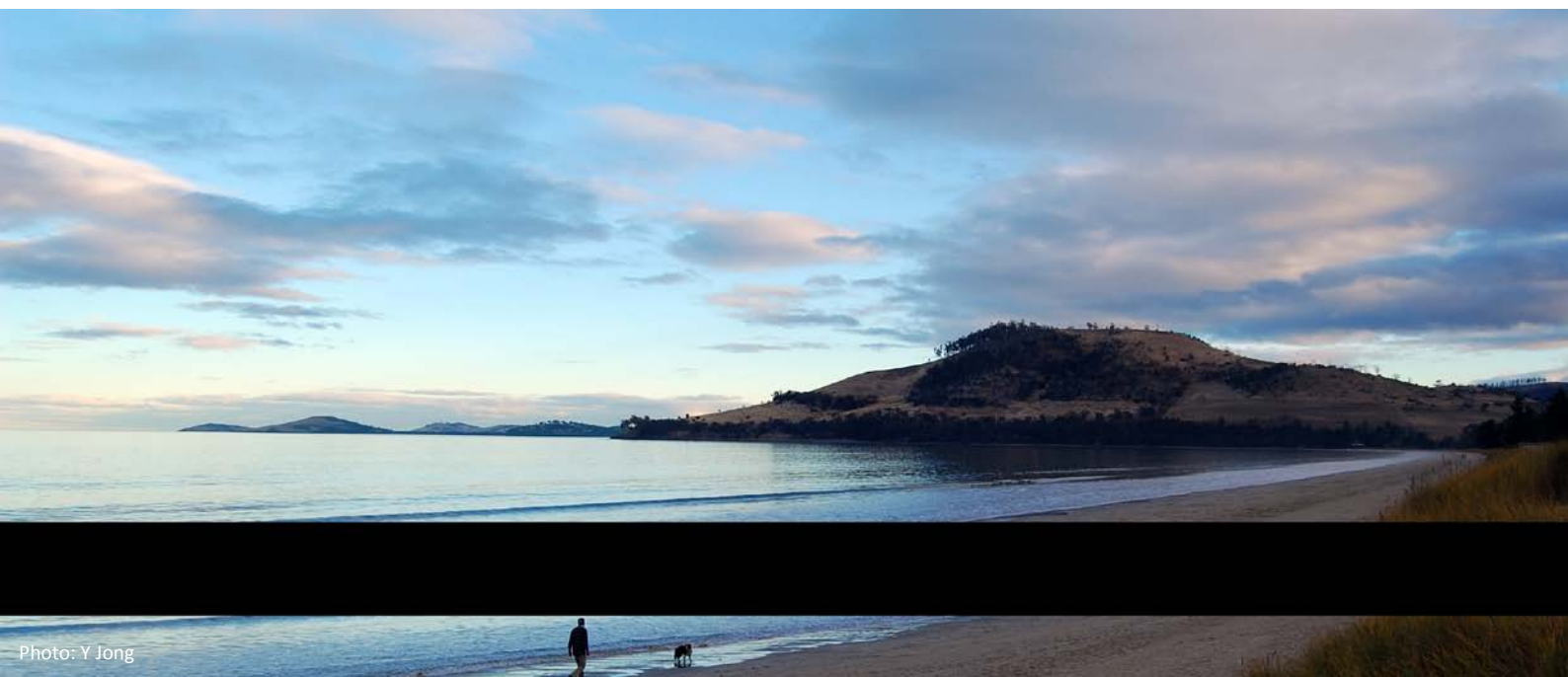
Acknowledgements:

Wyndham Vacation Resorts Seven Mile Beach

Kim Millington, WVRAP Seven Mile Beach, Resort Manager

Derek Howe, WVRAP Seven Mile Beach, Horticulturist

Markus Sigmann, Wyndham Vacation Resorts Asia Pacific Pty. Ltd., Director Resort Operations



SONEVA FUSHI

Managed and Owned by Six Senses Resorts and Spas
Kunfunadhoo Island, Baa Atoll, Maldives
65 villas
Opened in 1995

*“Intelligent Luxury - offering care and attention to the environment
while providing all modern day luxuries”*
Six Senses Soneva

FROM LITTLE DREAM TO BIG REALITY

Soneva Fushi was opened in 1995 to cater to a niche market of travellers looking for an alternative to conventional resorts. Not only is this luxury resort located on a remote island in the northern Baa Atoll of the Maldives, it lacks the extravagance most people equate with luxury, including a “no news no shoes” policy encouraging guests to enjoy the natural environment through activities having low impacts on the environment and surrounding communities. 15 years later, their dream of opening a destination resort with low impacts on the environment and community where it operates has grown into a company that currently includes four resort brands, 15 properties, 28 spas and a destination spa present in six countries.



“If you want to be a leader, you have to be innovative”
Piet van Zyl, Area Property Maintenance Manager

The Company Ethos

The core purpose of the Soneva brand is to actively protect the environment and communities where its hotels operate. The resulting product is what Six Senses refers to as “Intelligent Luxury,” a redefinition of luxury where guests can enjoy luxury in a socially and environmentally responsible way.

An Evolving Project

Soneva Fushi addresses social and environmental concerns in each decision-making process and regularly monitors key sustainability indicators to identify areas for improvement and necessary action plans. Steps towards a sustainable resort include its low impact design, a ban on all bottled water imports, experimentation with deep seawater cooling, and installation of solar panels. In addition, the resort is actively involved with community development projects supporting surrounding communities and improving the long-term sustainability of the Maldives as a place to live and a as tourism destination. The success of Soneva Fushi, fast approaching its 15-year anniversary, is testament to the success of the Intelligent Luxury concept without compromising economic viability or guest experience.



ENVIRONMENTAL PROTECTION

The Maldives relies on its environment to support the growing tourism industry. However, coral bleaching, rising sea levels and increased pollution are realities negatively impacting the future and tourism outlook of the country. Acknowledging environmental protection can have direct impacts on the country's natural resources and attractiveness of the destination, Soneva Fushi incorporates environmentally sensitive operating practices into its business model.

Sustainable Design

Site Conservation Tactics

- The landscape is largely intact, minimizing impacts on the island's flora and fauna
- Buildings are built around trees to avoid tree removal and some walkways are raised to minimise impacts on flora and fauna on the ground
- A low plot ratio encourages landscape growth, enhances the sense of destination and provides visual and sound barriers for added privacy
- Buildings height is limited to 2 stories to minimise the visual impact on the island, shade buildings and maximise sun exposure for trees
- Native plants are used to reduce the need for irrigation
- Pathways are kept narrow to reduce tree removal and are made of sand to avoid concrete
- A floating platform in the ocean accommodates sea planes to avoid destruction of the island's coral reef and to reduce impacts noise pollution can have on wildlife
- Stilted piers are built to preserve the coral reef and encourage the natural flow of water and sand around the island

Sustainable Materials

- Volatile organic compound (VOC) free, low chemical and chemical free materials and treatments
- Sustainably certified wood
- Durable and fast growing bamboo
- Drift wood, palm leaves and other waste wood on the island for use in signs, furniture and fences
- Landscaping provides natural privacy screens instead of fences
- Plastics are avoided unless absolutely necessary

Design and Passive Cooling

- Open air structures in public spaces provide natural ventilation and light AND eliminate the need for air conditioning of public spaces and supplemental lighting during the day
- Open air bathrooms offer natural ventilation and light
- Peaked ceilings provide cross ventilation and passive cooling
- Heavy landscaping provides shading to naturally cool the island

SERF Fund

The SERF (Social and Environmental Responsibility Fund) Fund for Soneva Fushi and Soneva Gili is used to sponsor projects addressing issues related to environmental conservation and social and economic welfare. The Social and Environmental Responsibility Manager for both Soneva resorts in the Maldives works closely with the Ministry of Environment in the Maldives, development finance groups like United Nations Development Programmes (UNDP), and various non-governmental organizations (NGOs) to select projects demonstrating accountability with achievable goals. In addition, he collaborates with managers and employees who are actively involved in the decision making process for fund allocation. Employee involvement empowers them to act as ambassadors to promote projects within their communities. Employees have also demonstrated initiative by developing their own ideas for funding.

MARINE PROTECTION

The resort has a marine biology centre managed by its dedicated marine biologist. In addition to organizing guided snorkelling trips providing guests with in depth information on responsible tourism and reef life, the marine biologist supports dedicated research work and assists NGOs and government parties to survey the marine environment as part of ongoing conservation projects. Soneva Fushi uses her knowledge and experience to influence the community to help protect the environment.

Coral Reef Protection

While many resorts build sea walls and breakwaters, or remove coral to create white sand beaches and clearances for boats, Soneva Fushi is designed to have minimal impacts on the marine environment. Stilted piers, mooring buoys, and designated areas for snorkelling and boats reduce harm to the island's coral reef. In addition, all guests and employees are provided with tips to responsibly treat the marine habitat.

Wildlife Protection

Turtle Beach on the island is a protected nesting ground for sea turtles in the area. By keeping a majority of the island's beaches undeveloped, using low levels of lighting, maintaining a lush landscape, and by educating employees and guests, the impact on nesting patterns of the sea turtles has been minimal.

For several years the resort has driven and supported a campaign against shark fishing to protect the local shark population and prevent adverse effects on the marine ecosystem. In addition to raising awareness and helping local fishermen find commercial alternatives, the campaign became one of the driving factors to lead the government to finally ban shark fishing in July 2010. Similar programs are in place to protect manta rays and other large marine animals.

Training and Education for Local Residents

The Soneva Nature Trip is one of Soneva Fushi's most influential programs and is organised by a local NGO called EcoCare. For 12 years the SERF Fund has sponsored a week long field trip for students from Male and neighbouring islands to raise awareness of responsible conservation practices through hands-on educational and nature-related activities. As part of the program, students, teachers and parents visit Soneva Fushi to participate in educational snorkelling trips with the resort's marine biologist, take walking trips to explore native wildlife and learn about the benefits of the resort's waste management techniques.

Using Consumer Behaviour to Influence Fishing Behaviour

Although Soneva Fushi is dedicated to supporting local fishermen, its fish suppliers used to indiscriminately catch marine animals to sell them to the resort. Although the resort recognised it would be difficult to change fishing practices in the Maldives without government regulations, they began to shift the fishing behaviour of their own suppliers by maintaining strict purchasing guidelines and refusing to purchase any animals that are overfished, endangered or unsustainably captured including undersized fish and lobsters with eggs. Over time, the fishermen have learned to stop capturing any animals that cannot be sold, and have indirectly learned the value of sustainable fishing. *Challenge: To make a real impact on fishing behaviour in the Maldives, other resorts must follow the same guidelines and fishermen must have options.*

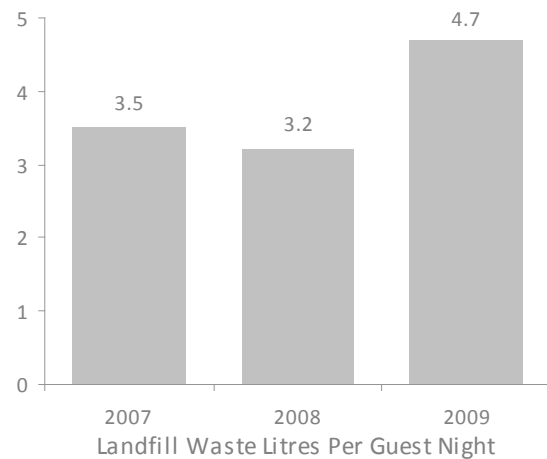
Third Party Participation

Six Senses has close ties with the President of the Maldives, who shares similar interests and hopes to make the country carbon neutral by 2020. The resort also acts as an advisor to the World Bank for the Maldives Environmental Management Project and the Atoll Ecosystem Conservation Project to protect the marine environment, develop sustainable tourism and improve waste management techniques in the Maldives. Some of the initiatives from these organizations include the development of a recycling facility and national waste management system.

WASTE MANAGEMENT

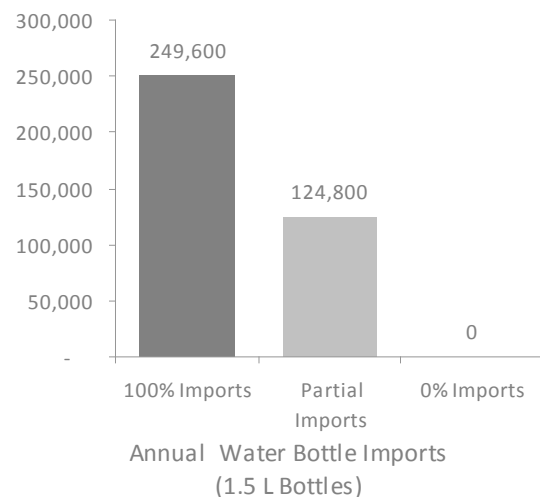
Virtually everything from building materials to food products are imported to the Maldives to support the local population and tourism industry. While development has improved the country's economic welfare, the increase in consumables and lack of waste management facilities results in growing landfills and polluted waters. Although large financial savings are not associated with waste management, the Maldives must acknowledge the consequences development has on waste production and its impact on the environment.

Although there is a 200% import tax on plastic items, the Maldives still lacks proper recycling facilities. Where recycling is limited or unavailable, "reduce and reuse" are essential to proper waste management.



Reduce & Reuse

- Producing drinking water on site reduces plastic bottle imports and waste produced by the resort
- In 2008 the resort completely eliminated bottled water imports which has reduced waste by approximately 250,000 bottles per year
- Glass bottles are reused for bottled water
- Ceramic dispensers for bathroom amenities eliminate the use of disposable plastic bottles typically found in hotels
- Plastics are avoided unless absolutely necessary
- Paper packaging reduces non-biodegradable plastic waste
- Suppliers reduce packaging and deliver in bulk
- Paper is used on both sides



The resort used to import 400 cases of bottled water per week. Since 2008, the ban on bottled water imports has eliminated close to 250,000 bottles from going to landfills



Recycle – Eco Centro

In 2008, Soneva Fushi developed a waste management centre called Eco Centro, where techniques to recycle waste reap environmental and economic benefits. Eco Centro was also designed to show local communities how waste management techniques can be duplicated at a low cost and low impact to the environment.

Waste to Wealth

- Organic material (including paper and cardboard) is mixed with garden waste and composted for garden fertiliser
- Waste wood is turned into charcoal and biochar used in the kitchen or buried underground to improve soil fertility, while sequestering carbon
- Driftwood is used for signage and decorations
- Coconut husks mixed with coconut fibres are turned into mulch used to prevent weeds and condition soil
- Glass is pulverised and used as a substitute for sand in construction projects requiring cement
- Metal is collected and given to recycling companies

The Eco Centro at Soneva Fushi is still under development and there are several areas for improvement. Pilot programs to develop biogas and suitable compost material are still in their development stages. *Challenges: The Eco Centro requires dedicated supervision to ensure the program is properly maintained.*

Non-recyclables – plastics, batteries, etc

Guests are made aware of waste management issues in the Maldives and participate by taking non-recyclable waste with them when they leave.

Community Influence

Many islanders in the Maldives currently dump solid waste into the ocean instead of sending it to landfills or incinerators. Six Senses is planning to develop a mini Eco Centro on the island of Maalhos with the help of a local NGO. By providing education and training, villagers will be able to take responsibility with regard to their waste. *Challenges: Although the younger generation understands environmental conservation, the older generation is difficult to influence. Without ownership and understanding of waste management issues, an Eco Centro on an island can be poorly maintained or mismanaged. To reduce this risk, Soneva Fushi is training a Maalhos resident at the resort's Eco Centro so he can properly manage and maintain the system once in place.*



SUSTAINABLE PURCHASING

Where possible, Six Senses follows purchasing guidelines to ensure the quality of the products they receive from suppliers with good CSR practices. In particular, they are dedicated to partnerships with suppliers sharing similar ethics and offering products locally produced, organic, fair trade and eco-friendly. In addition, they investigate the history of the company, the origins of the products and understand the waste disposal impacts such products have on the environment. *Challenges: Although this policy is ideal, it is often impractical in a remote destination like the Maldives where there is a limited number of suppliers. As such, the following measures are taken to source sustainable items where possible.*

On-Site Organic Garden

The resort's gardens produce a variety of fresh fruits, vegetables, herbs, spices and mushrooms for use in the guest and employee restaurants. In addition to being organic, there are no greenhouse gas emissions related to transportation. *Challenges: The lack of land and expertise limit the variety of produce they can farm.*

Purchasing Locally

Purchasing locally supports the local economy and reduces greenhouse gas emissions. Six years ago, only 10% of produce could be purchased locally. With improved farming techniques, the resort can now purchase 20 to 25% of its required produce locally. *Challenges: Although the fishing industry is strong, the range and consistency of produce in the Maldives is lacking. In addition, many items are not available in the country which requires the resort to import the remaining items.*

Addressing the limitations of local supplies

There are several initiatives to promote local agriculture with assistance from the Ministry of Agriculture and NGOs providing training and financial support to local farmers. The resort participates by providing funding through SERF, and by purchasing directly from local fishermen and farmers, whenever possible. Other examples of support for local suppliers include the following:

Supporting Local Business Operators

A local NGO called Live & Learn developed a program to help local women earn a living by making preserved chili sauces and fruit jams. Although the quality of the products was good, they lacked the marketing skills needed to sell them. Six Senses resorts provided marketing support, helped with packaging and labelling of the products, and will purchase the preserved jams for use in their resorts when available.

Supporting Employee Initiated Projects - Melons in the Maldives

Two Soneva Gili employees who come from the same island saw the potential to develop a melon farm on their native island. However, the start-up costs were high and the pair lacked the skills needed to process the grant application. Six Senses provided administrative support through the process, and with the success of their application and implementation of crop rotation farming, they now produce a variety of rock melons, honeydew and watermelons sold to resorts, including Soneva Gili.



*“Everything we do now we have to ask,
how much energy is this going to need?”*

Laurie Burr, General Manager

A BOLD PLAN TO DECARBONISE...

SIX SENSES BY 2020

Although Six Senses has made strides in reducing their impact on the environment, the group is taking their dedication to environmental protection one step further by decarbonizing by 2020. The plan will eliminate the properties’ reliance on fossil fuels and offset any greenhouse gas emissions resulting from both direct and indirect sources. This long and detailed process is ambitious, but will be significant for the hospitality industry, differentiating Six Senses as the first hotel company to use less energy than it generates, and offset all carbon emissions it produces.

Approach

Six Senses has developed its own carbon calculator modelled after the *World Resources Institute / World Business Council for Sustainable Development (WRI/WBCSD) “Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition” (the “Protocol”)*. This calculator estimates the carbon footprint of each resort based on building energy, waste, ground travel, air travel, shipping, paper and food including direct emissions produced on site and indirect emissions resulting from imports and outsourced business activity. While many companies only address scope 1 and 2 emissions, Six Senses will decarbonise its assets for all of scopes 1, 2 and 3.

Emission sources are identified by the Protocol as follows:

Scope 1 Direct Emissions	Scope 2 Indirect Emissions	Scope 3 Indirect Emissions
From sources owned by group	From generation of purchased electricity	<ul style="list-style-type: none">• Emissions that occur from sources not owned or controlled by the group• Landfill waste• Air travel• Ground travel• Freight shipping• Paper• Food (guests and hosts)

Source: Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition

Many resorts in the Six Senses group now regularly monitor their carbon footprints. By understanding their level of emissions, each property can suitably implement programs to:

- Identify cost effective improvement opportunities;
- Improve energy and material impact of processes, products and services; and
- Enhance the guest experiences while reducing the impact on the planet.

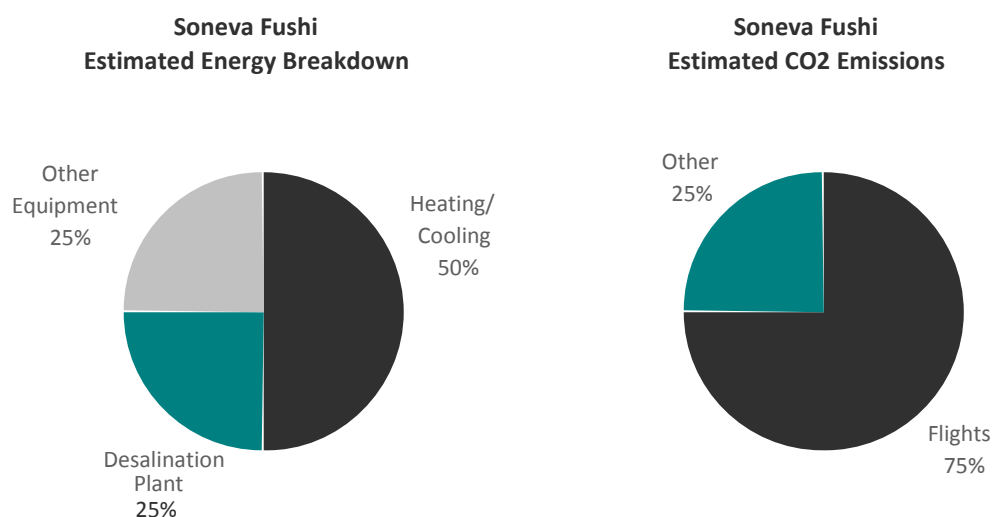
DECARBONIZING SONEVA FUSHI BY 2012

Of all the Six Senses hotels, Soneva Fushi faces the most challenges in reaching a zero carbon operation. Not only is this the oldest hotel in the group, it attracts guests from around the world who travel long distances by plane to reach the secluded destination, while the lack of domestically produced goods means almost all building materials, interior fixtures, furnishings and equipment and supplies need to be imported. In addition, the resort currently relies on diesel fuel to generate 85% of its energy. However, because Soneva Fushi is the only property wholly owned and managed by Six Senses, it is also the most suitable property to be used as a model for decarbonization within the group.

Challenges

- Remote location results in high CO₂ emissions associated with guest and employee flights
- The lack of locally available goods results in high imports
- The resort currently relies on diesel fuel to generate 85% of its energy
- Even after additional measures are enforced to reduce energy use and eliminate diesel in the resort, a carbon offset program will still be required to offset flights and the transportation of any imported items

To reach the zero carbon goal by 2012, Six Senses has invested significantly in the employment of professionals and consultants to highlight strategies, consistent monitoring of resource use and carbon emissions, and developed its own carbon calculator based on the World Business Council for Sustainable Development.



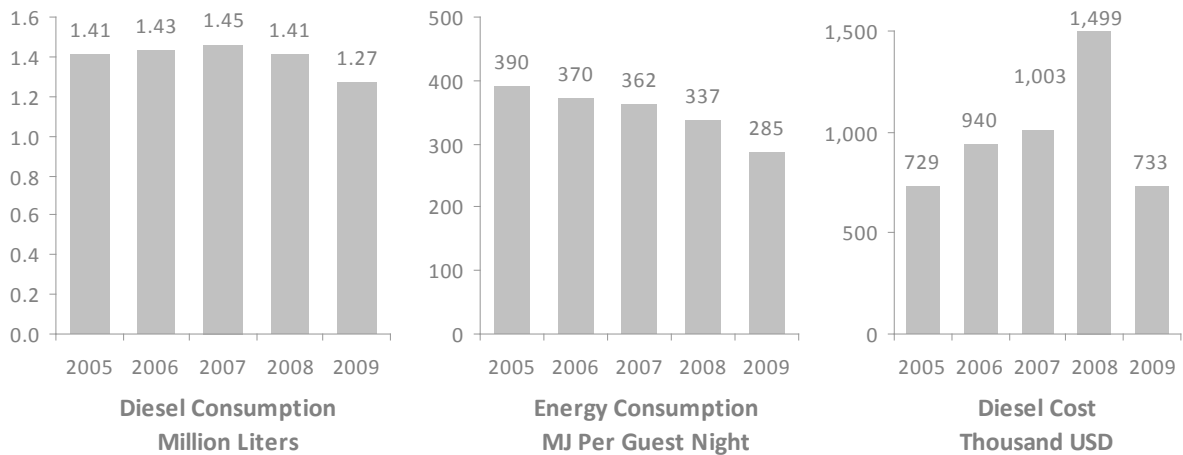
Current Carbon Offset Program

A survey of CO₂ emissions from the resort between 2008 and 2009 revealed approximately 75% of all carbon emissions resulted from guest and employee flights. Because flight travel is essential to the resort and mostly uncontrollable, Soneva Fushi offsets these emissions through a wind turbine project in southern India. To offset flights, the resort adds a 2% carbon tax to each room rate and uses a carbon calculator developed together with Carbon Foresights. In 2009, the resort recorded and offset the following:

- 5,929 guest flights covering 140 million kilometers from as far as Buenos Aires, Argentina
- 329 host flights covering 2.9 million kilometers, with most flights to or from nearby India or Sri Lanka
- Although all guests are charged the 2% carbon levy on room cost, there has been virtually no opposition from guests

Current Energy Situation

Unlike many resorts in the Maldives with barren landscapes, Soneva Fushi was designed to preserve the rich landscape which naturally cools the island. Sustainable design practices also maximise natural ventilation and lighting to minimise air conditioning and supplemental lighting requirements. Despite these measures, 50% of the resort's energy is consumed by cooling and heating, and 85% of total energy is produced by diesel fuel.



Although diesel use has been relatively stable and the resort has improved its efficiency in energy consumption per guest night, cost savings are not directly associated due to fluctuations in energy costs. Without implementing energy savings tools including the following, annual cost increases would be more pronounced.

2007 –Heat recovery

Where water used to be heated with 20 electrical water boilers, a heat recovery system now uses waste heat from generators and the laundry system to heat water.

2008 – Pilot program to create biogas

Benefits: Using organic waste to create biogas reduces solid landfill waste and produces gas for kitchen use.

Challenges: Difficulties faced to efficiently store and distribute the biogas.

2008 – Pilot program for deep sea water cooling

Deep sea water cooling would be a cost effective and environmentally friendly way to cool the hotel. As seen at InterContinental Bora Bora, energy consumption for cooling is reduced by 90% compared to other hotels.

Challenges: Although the hotel invested substantially in this program, operational and maintenance issues of the distribution system prevented the pilot program from continuing.

2009 – Pilot program of photovoltaic solar panels

The panels cost USD 300,000 with a payback period of 7 years based on current energy costs. The current yield is 3% of energy used at the resort.

Challenges: The vegetation cover of the island preserves the ecosystem, cools the resort and offsets carbon emissions. Large tracts of the island's rich landscape would need to be cleared to facilitate solar panels and may also have other adverse impacts on the island.



Carbon Zero Future

Although energy savings have improved, the resort's goal is to eliminate use of diesel for everything except its emergency generator. The following is a list of potential programs to be implemented by 2012.

Building management system (BMS)

Building management systems can monitor and efficiently control energy loads throughout a resort and are expected to save up to 10% on total energy consumption.

Eco-conversion of facilities

Better insulation can greatly reduce the loss of cool air exiting rooms through existing window and ceiling leaks, and the amount of heat entering rooms through windows and openings.

Challenges: The villas were originally built to promote outdoor living and natural ventilation. By closing all ventilation gaps, passive cooling and cross ventilation is restricted.

Biofuel

Alternative fuel sources derived from renewable biomass products can be used in the resort.

Challenges: The fuel source does not always come from sustainable sources (i.e. from the non-edible industry). The lack of research data on more sustainable fuel sources, like Jatropha, raises the issue of long term viability. In addition, such fuel sources can also cost more than diesel, reducing economic viability.

Photovoltaic solar panels

Photovoltaic solar panels can generate renewable energy

Challenges: Long payback and clearing trees for solar panels may have other adverse impacts on the island

Solar thermal energy

Solar thermal energy replaces less efficient air conditioning units with an absorption chiller that pumps cold air into villas and stores hot water and steam for resort and laundry use. This system can save up to 50% on energy consumption from heating and cooling.

Challenges: Access to sunlight is limited and a backup generator is still required.

LED lights

LED lights reduce the energy load by 75 to 80% from existing globes and last up to 3 to 5 years, reducing bulb and maintenance costs. LED lights also eliminate the mercury content released during the disposal of CFL bulbs and reduce the amount of waste.

Challenges: LED lights are still being developed in terms of quality but are still expensive to purchase.

Solar shingles

Solar shingles can be installed on guest villas without impacting the exterior design. These shingles can store energy to support cooling when energy from the solar thermal system is depleted

Innovative insulation materials including thermal barrier paint and reflective glass film

Insulation materials can provide insulation without having to retrofit existing villas.

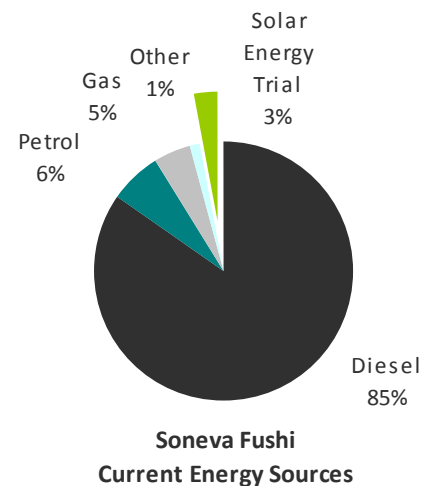
Challenges: the newness of such technologies makes them expensive to purchase.

Water use reduction and rainwater catchments

25% of energy is currently consumed by the desalination plant. Reducing water use and installing rainwater catchments can reap large savings.

Other experiments

- Installation of energy efficient minibars that use 5% of the existing energy load for minibars.
- Production of biogas from organic kitchen material.
- Use of biofuel for boats.
- Possible expansion on existing rainwater catchments to reduce the requirements of the desalination plant.



SONEVA FUSHI: BUSINESS CASE OVERVIEW

Key Takeaways

Regardless of location, positioning and scale, all hotels have the opportunity to implement environmentally sound practices reducing greenhouse gas emissions and costs. Soneva Fushi is an evolving project experimenting with ways to reduce its environmental impact. The goal to be zero carbon by 2012 is an aggressive one, but will ultimately save costs in the long term.

Business Generation and Customer Loyalty

A transparent sustainability policy can generate demand and loyalty from guests seeking products resonating with their own values. At Soneva Fushi, 40% of guests are Six Sense's repeat customers referred to as SLOWLIFERs. Although the primary decision making factors are the product, services and overall experience, many communicate their understanding and appreciation for the group's sustainability policy and dedication towards sustainable tourism.

Community Engagement

Community and government collaboration has positive impacts on the overall environment where a hotel operates. Soneva Fushi actively collaborates with the local government, led by President Nasheed, to develop best practices can be duplicated elsewhere in the Maldives. At present, the resort is involved in a nation wide waste management project led by the government in cooperation with UNEP and the World Bank.

Why They Do It?

Environmental sustainability is critical in an environment where climate change has negative impacts on tourism and the environment in general. The choice to be carbon neutral at Soneva Fushi reflects personal values of its owners and their interest to lead by example in a destination suffering from overdevelopment, overfishing and poor waste management programs. By setting an example, Soneva Fushi hopes other resorts and communities will consider environmental sustainability as a priority and combat climate change.

Acknowledgements:

Six Senses Resorts & Spas

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Soneva Fushi

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Anke Hofmeister, Soneva Fushi, Marine Biologist & Environmental Manager

Rajesh Bhupathi, Soneva Fushi, Purchasing Manager

Mauroof Mohamed, Soneva Fushi, Assistant Human Resources Manager

Soneva Gili

Jacco van Teeffelen, Soneva Gili, Resort Manager

Sanjeeva Ranasinghe, Soneva Gili, Executive Chef

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THE SCHOOLHOUSE

Owned by multiple owners and managed by The Schoolhouse

Mutianyu Village, Beijing, China

11 houses, 30 rooms

Opened in 2006

The success of the Schoolhouse is a direct result of ownership commitment to using existing building footprints, local people and local food. It is a unique project which, unlike most in China, offers rental income and jobs directly to villagers and converts dilapidated farmhouses and buildings into a hotel project that maintains a sustainable community. The value-add to the community and dedication engendered has acted as a tourism and economic development model adopted by the local government who are now supporting the development of similar initiatives with a focus on environmental and cultural conservation in the region.



LABOUR OF LOVE

Sixteen years ago, an expat couple living in Beijing visited the Mutianyu section of the Great Wall of China. Although Mutianyu was an unknown village with a population of fewer than 400 residents, the small village charm and good salesmanship of a t-shirt hawker left a lasting impression on the couple. Instead of leaving with a mass produced souvenir like most, the couple left Mutianyu as proud leaseholders of a rundown farmhouse they could use as a country home.

The narrative of how The Schoolhouse evolved is one that may resonate with many urban dwellers on a personal level. Several years later, the couple left the fast paced lifestyle that defines urban living in Beijing and dedicated their energy to the renovation of their rural Mutianyu home. Out of personal interest, they preserved the façade of the building and improved the interiors with modern day comforts, which results in an architectural fusion that maintains the historical integrity of the building, yet offers the spaciousness, functionality and details of a well designed urban home.

The longer they lived in Mutianyu, the more their friends both in and out of China desired similar retreats. With help from the couple, additional homes were acquired and foreign investments were channelled directly into the pockets of the villagers. To supplement relatively meagre incomes earned from farming, villagers earn rent on underutilised or abandoned buildings and acquire jobs as contractors assisting with the renovation and repurposing of buildings into vacation homes.

THE RURAL vs. URBAN MIGRATION

Although these individuals deliberately chose to have homes in Mutianyu, villagers continued to make the reverse migration into the city to seek job opportunities and higher incomes that were unavailable in rural areas. The declining population of middle aged men and women in combination with the one child policy resulted in an even greater decline in youth, making the local schoolhouse obsolete. Although the foreign investments from these projects could support some homeowners and contractors, it wasn't enough to sustain the local economy which continued to decline.

COMMON & COMMUNITY INTERESTS

As foreign investments increased in Mutianyu and expanded into neighbouring Yingbeigou, the mayor asked the couple to consider additional approaches to support the community and its economy. In response, the couple and two friends acquired the lease for the vacant schoolhouse in 2006 and converted it into a restaurant and art glass studio to attract tourists coming through the village on their way to the Great Wall. The Schoolhouse hired local villagers as contractors and staff, village housewives to cook in the kitchen and partnered with local farmers to supply locally and organically grown meats, fish and produce.



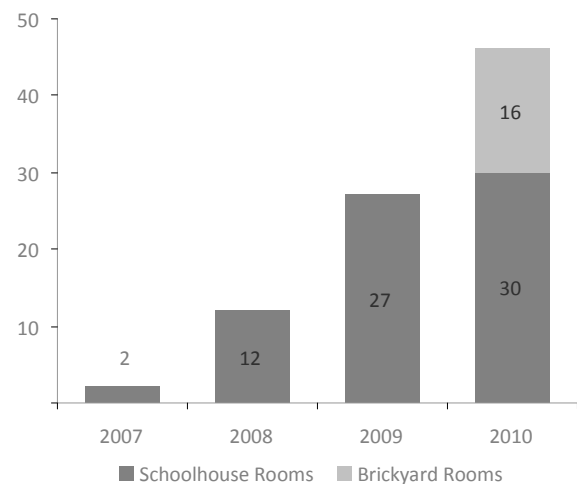
“We can't succeed by being anti-development, but we can hope to influence the course enough so that our area isn't overwhelmed and something of the traditional rural lifestyle is preserved.”

Jim Spear, Partner, The Schoolhouse

NATURAL GROWTH

As the first phase of The Schoolhouse opened, two more buildings were acquired to serve as a noodle house and the first lodging facility. Simultaneously, partners of The Schoolhouse continued to help friends acquire and remodel homes to be used for personal use, or put into the hotel rental pool under a management agreement. The addition of new homes in the rental pool helps The Schoolhouse accommodate more individual travellers and increased business from groups and meetings.

The Schoolhouse now has 11 homes with a total of 30 rooms, and has recently opened The Brickyard, a 16-room product located in an old ceramic tile factory.



EXISTING FOOTPRINTS - Sustainable Redevelopment

In many cases, it would have been cheaper to tear down the rundown buildings and start from scratch, but the use of existing structures and materials is the greatest form of recycling.

- No displacement of villagers
- Fair market rent paid directly to villagers
- Villagers are involved in development, design and construction
- Preservation of exterior façade
- Removal of structurally weak facilities
- Reuse of salvaged materials
- Restoration of roofs with proper weather barriers and insulation
- Restoration of structurally sound interior beams and columns
- Restoration of landscapes and courtyards
- Construction of extensions blending in with the architecture
- Insulation, thermal paned windows, thermal paint, natural ventilation, natural light, passive solar design
- Additional building materials are sourced locally
- Local contractors





Xiaolumian

Xiaolumian, which translates to Little Hut Noodles, is a converted farmhouse belonging to a villager. In addition to leasing his property, the group has provided him with employment and lodging on The Brickyard site. Xiaolumian serves handmade noodles and dumplings and can be used for private functions.

The Brickyard

The Brickyard is a 16-room property in an old ceramic roof tile factory. Old kilns were converted into offices and meeting rooms, and three rows of hotel rooms were built using existing structures and salvaged bricks. Unlike The Schoolhouse, The Brickyard has the room capacity, a dedicated restaurant and facilities to cater to meeting groups without dispersing them across several houses. The previous owners were appropriately compensated to close the factory and its coal operated kilns, greatly improving Yingbeigou's air quality.

The Smithy

The vacant village blacksmith shop was converted into The Schoolhouse's fine dining room.



LOCAL FOOD - Sustainable Foods

Purchasing locally supports the local economy, ensures freshness and reduces greenhouse gas emissions associated with food transport.

- Village housewives work alongside the executive chef
- Dishes use fresh local ingredients
- Salad greens come from the hotel's organic farm
- Fruit and nuts come from the fruit trees scattered throughout the yards of individual houses in Mutianyu
- Additional produce is purchased from local farmers and all meats and fish are purchased from local farmers
- Honey is purchased from a local beekeeper
- Breads, jams and spreads are made on-site
- Fair trade coffee is from Yunnan Province
- Filtered water is available in restaurants and homes reducing plastic bottle waste

While many ingredients are still imported due to the lack of high quality organic or fair-trade alternatives available in China, the hotel continues to seek local suppliers to substitute imported ingredients. To improve the variety and success rates of its own produce, the Schoolhouse is employing a full-time agriculturist with extensive experience in organic farming to help expand the garden varieties available on-site.

Food focused events include food festivals, cooking classes, fine dining events and a community service day where all proceeds from the restaurant are donated to a local charity fund.



LOCAL PEOPLE

Hiring locally offers benefits for the hotel as well as the community.

Benefits to the Community

- The Schoolhouse offers jobs not previously available in the village
- Direct employment includes part-time and full-time positions in the hotel, restaurants and art studios
- Additional outsourced services, including construction and landscaping, provide jobs for nearby villagers
- Directly and indirectly, The Schoolhouse is responsible for the payroll support of approximately 200 villagers
- Villagers are given job opportunities without having to migrate to the city
- Work and language skills are developed
- Money spent on labour costs from The Schoolhouse stay within the community
- Local workers have a sense of ownership and empowerment and are more thoughtful of the local community and environment
- As demand for The Schoolhouse grows and expansion occurs, additional jobs will be created

Benefits to the Hotel

- Locally hired employees have a greater sense of ownership towards the project and are more dedicated
- There is no need to offer the housing, transport or travel packages required if employees lived further away or come from other provinces
- Local employees have a sense of ownership adding value and longevity to the overall project
- Staff turnover is minimised

Because the skill set of local villagers is not yet at the management level, the employment of outside managers is required. As skills are developed, the potential to have local managers will reduce the turnover rate of the management team.

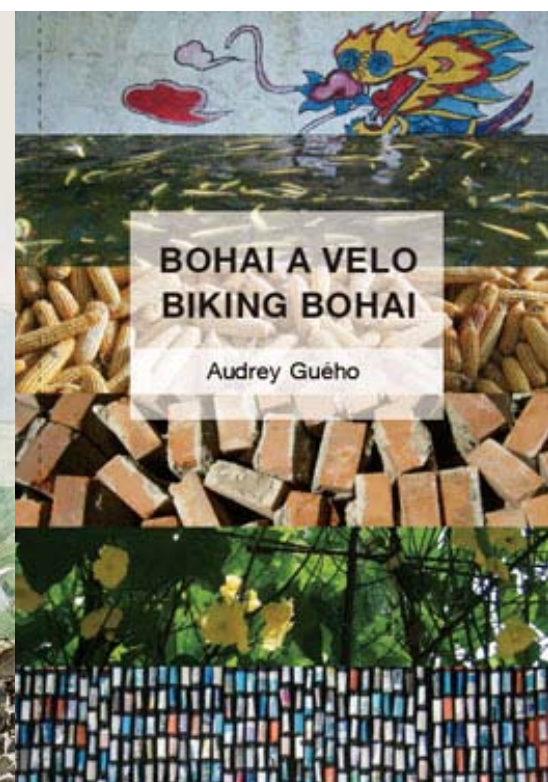
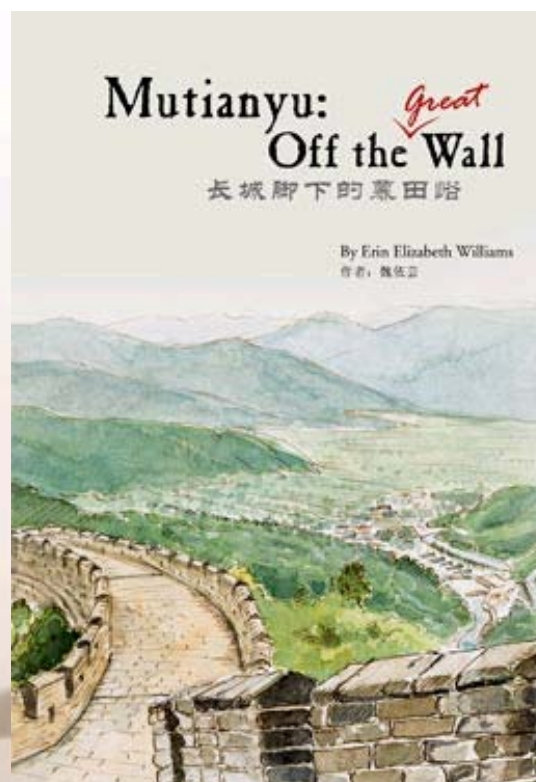
USD 10.3 million from foreign funds
USD 4.4 million from the local government

COMMUNITY DEVELOPMENT

- To date, up to RMB 100 million of foreign and local funds have been channelled directly to the local community
- 200 salaries are supported
- Annual charity events help raise additional funds
- The hotel offers a range of educational materials on its website to promote sustainable communities
- Hotel guests and student groups can visit local families to see how they live. Villagers volunteer to be part of this program. To prevent over visitation, visits are restricted in size and frequency.
- Fellowship programs sponsor resident artists so they can focus on their work
- A sister village program with Shelburne Falls, Massachusetts (USA), has funded several Mutianyu villagers travelling to Shelburne Falls to meet and exchange ideas
- Books have been written and published by interns exploring the history and environment of Mutianyu

INFLUENCING OTHERS

- Seeing how The Schoolhouse positively influenced the local community and economy, the local government has responded by committing RMB 30 million to improving the infrastructure of the immediate area
- To ensure the area is properly developed, the government has introduced a master plan focused on conservation of existing footprints and buildings, architectural integrity, limited plot ratios, low height restrictions and cultural preservation
- The Schoolhouse model is already being duplicated in villages elsewhere by outside investors building similar vacation homes and hotels
- The Schoolhouse is being studied as a model for villages elsewhere in China



THE SCHOOLHOUSE: MISSION STATEMENT

Our business philosophy is sustainable tourism. We use existing buildings, we hire and train local people, we source food products locally, and we offer handicrafts made on site.

We also sponsor educational and cultural exchange programs that help visitors understand village life and that foster broader horizons for our rural neighbors.

Like the primary school we have built upon, our mission is very simple – the ABC's:

- *Respecting people*
- *Operating legally and ethically*
- *Providing customers with pleasant experiences*

These simple guiding principles act as the cornerstone for our business practice. We have found they do a good job in helping us pursue a broader philosophy. Nowadays rural communities are shrinking as the young flee to jobs and excitement in cities and the rural population declines and ages. Nowhere is this more pronounced than in China, which has rapidly transformed from a nation of villages to one of ever-expanding cities. While progress is undeniable, townships have been an afterthought in this push towards modernization. Our goal is to help provide modern livelihoods so that people have the economic ability to sustain the life of the village of Mutianyu and of its surrounding rural communities without having to leave home.

Our goal is to grow alongside the communities where we do business, and progress while also preserving tradition. Mutianyu's abandoned village primary school was transformed into our main restaurant and office, symbolizing our efforts to preserve, maintain and encourage the life of these small villages. Hence our name, The Schoolhouse. All of our business properties started off from run-down buildings. Of our rentals, each original house was leased at market prices from individual peasant families who received the proceeds directly. No one has been displaced by any of our development projects.

We work closely with our neighbours, the village governments, and park authorities to ensure our developments fit into the community and contribute to helping Mutianyu become a distinctive and sustainable Great Wall destination. Something very different from the glitzy five-star hotels. But also something very special. We hope you will agree, and we look forward to seeing you out in Mutianyu, where as a visitor you will have the chance to gain insight into a rural community that is joining the modern world.

The Schoolhouse was conceived and invested in by China Bound Ltd. as part of a broader program to create a variety of sustainable tourism enterprises. Learn more at www.chinaboundltd.com.

THE SCHOOLHOUSE: BUSINESS CASE OVERVIEW

Key Takeaways

Commitment to social sustainability in the community in which a hotel operates can have positive impacts on the business model. The core of The Schoolhouse's business model is dedication to village conservation and community development. These principals clearly differentiate it from other hotels in China, supporting business growth from one house with two rooms, to eleven houses and one building with a total of 46 rooms (30 rooms in The Schoolhouse and 16 rooms in The Brickyard).

Cost Savings

Supporting the local community with job opportunities and partnerships can save on operating expenses. The Schoolhouse hires locally and is directly and indirectly responsible for the salaries of 200 villagers. By giving villagers the opportunity to work in their home district, The Schoolhouse benefits from low turnover and cost savings related to training. Operating an on-site garden and purchasing ingredients and supplies from local suppliers and farmers can be cost efficient, while ensuring money is kept within the community.

Revenue Enhancement and Customer Loyalty

A strong social sustainability policy communicated to guests can generate revenue and customer loyalty. Social sustainability is ingrained in the business model of The Schoolhouse, and while it may not be the primary decision making factor for guests, those who stay are often captivated by its story and recommend it to friends. A majority of reservations at The Schoolhouse result from word-of-mouth marketing. The gradual increase in new supply has been absorbed by increases in demand, while there is also growing demand from the domestic market.

What Doesn't Work?

The lack of locally available organic and free-trade products limits The Schoolhouse's ability to serve a fully organic or locally produced menu. Organic and free-trade ingredients available in China are also sold at premium prices driving up food costs. As such, a compromise is made between offering a wholly local and organic menu and importing select ingredients ensuring a high quality and well balanced menu.

The long term sustainability of The Schoolhouse requires full support from local staff who have a sense of ownership and pride for the project. While 40% of the management team are locally hired, the lack of management skills in the local labour pool requires hiring additional managers from outside the township. While The Schoolhouse is seeking ways to improve the management skills of their local employees, it currently suffers from high turnover from some managers who have the required skills, but lack long term vision and dedication to the project.

Why They Do It?

The Schoolhouse is a for-profit business thriving in the community it works with and at the same time protects. Without these guiding principles, the potential overdevelopment of the villages would not only diminish the product appeal of The Schoolhouse, but also have major negative impacts on the future of the community.

Acknowledgements:

The Schoolhouse
Jim Spear, The Schoolhouse, Partner
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Peiming Wang, The Schoolhouse, Partner
Randhir Singh, The Schoolhouse, Executive Chef
Lauren Tang Spear, The Schoolhouse, Guest Relations
Morgan O'Hara, Mutianyu Great Wall, Dining, Lodging & Events

SHINTA MANI

Owned and Managed by Shinta Mani Corp
Oum Khum & 14th Street, Siem Reap, Cambodia
18 rooms (expanding to 39 in 2011)
Opened in 2003

Shinta Mani is a boutique hotel in Siem Reap built around a foundation of sustainable tourism. While the hotel acknowledges a single property has difficulty addressing the cumulative impacts of poverty in Cambodia, it strives to make an impact on the welfare of Cambodians by raising guest awareness, administering vocational training programs and language education, and providing assistance with basic food, water and shelter. Although the hotel's Development Centre was initially established to provide vocational training to unskilled adults, the hotel's initiatives are now spread across several villages and have benefited thousands in rural Siem Reap with the support of private donations from Shinta Mani guests.



“We run hotels that are a functioning viable business unit, but which also provide opportunities for underprivileged youth in developing countries, by giving them the skills and education which allow them to achieve gainful employment.”
Shinta Mani

ONE MAN’S DREAM OF PHILANTHROPY:

The Development of Shinta Mani and the Institute of Hospitality

Like many others, the owner of Shinta Mani fled Cambodia as an adolescent to Thailand amidst political unrest in the 1970’s. Although his family developed a successful jewellery business in Thailand, he returned to Cambodia in the 1990’s where he worked in several industries and founded a non-profit healthcare organization helping finance the training of medical professionals at the Sihanouk Hospital Centre. In 2003, he was given the chance to rebuild the historical Hotel de la Paix in Siem Reap originally built in 1955.

Although the new hotel could cater to a modern day Siem Reap – now open to international visitation and experiencing exponential tourism growth – the six decades of history in Cambodia preceding its reopening still weighed heavily on the country’s socioeconomic status and political environment. Direct impacts on the development of the new property included construction delays due to political instability and a general lack of skilled labour that would make staffing difficult. Recognizing the situation in Cambodia, he decided to establish a hotel that would serve as a for-profit business incorporating programs to improve the welfare of the local community.

Construction delays for Hotel de la Paix prompted the opening of a separate hotel, Shinta Mani, in a neighbouring building originally earmarked for expatriate staff housing. Shinta Mani, Sanskrit for “a gem that provides for all,” opened with 18 hotel rooms and a free vocational school addressing the need for skilled staff, and providing opportunities for adults who would otherwise rely on menial jobs at very low wages.

Development Centre

The Shinta Mani Development Centre is funded by hotel operations and private donations and provides unskilled adults with training and life skills to work in a commercial hotel. The program, now in its 7th class of students, has raised more than USD 170,000 in outside support and has positively impacted the lives of 161 students and their families. One of the most notable awards the program received was from the 2006 World Travel Mart in London for “Best Poverty Reduction.”

The selection process

Students are selected based on aptitude and need, and include orphans, the disabled and the physically abused who are generally considered unemployable.

The curriculum

The 10-month curriculum covers training in the kitchen, front office, restaurant, spa, housekeeping, finance and maintenance departments, and provides life skills and English language training.

Skill	Description
Kitchens (101)	Local and international cuisine, bakery and pastry, hygiene standards
Food Service (102)	Generic food and beverage Service
Front Office (201)	Generic front office skills
Housekeeping (202)	Rooms and public areas
Spa (203)	Spa and beauty treatments
Engineering (301)	Electrical, plumbing, carpentry and general
Landscaping (302)	Garden and grounds maintenance
Language (401)	Entry level English
Life Planning (501)	Interview skills, financial planning and other

Student benefits

Students also receive a monthly stipend of USD 10, a weekly allocation of rice to support their families, uniforms, supplies, and in some cases bicycles for commuting to the school. Students who complete the course receive a certificate of completion and assistance with job placement. To date, 100% of graduating students have received successfully job placement. Those unable to find immediate placement are provided with additional training, continued financial support and assistance with job placement.

Challenges

The primary challenge is to encourage students to complete the program. With varied backgrounds, levels of schooling and comprehension, the school offers flexibility, additional classes, tutorials and mentorship to students who might otherwise get discouraged.



Community Based Activities & Guest Participation

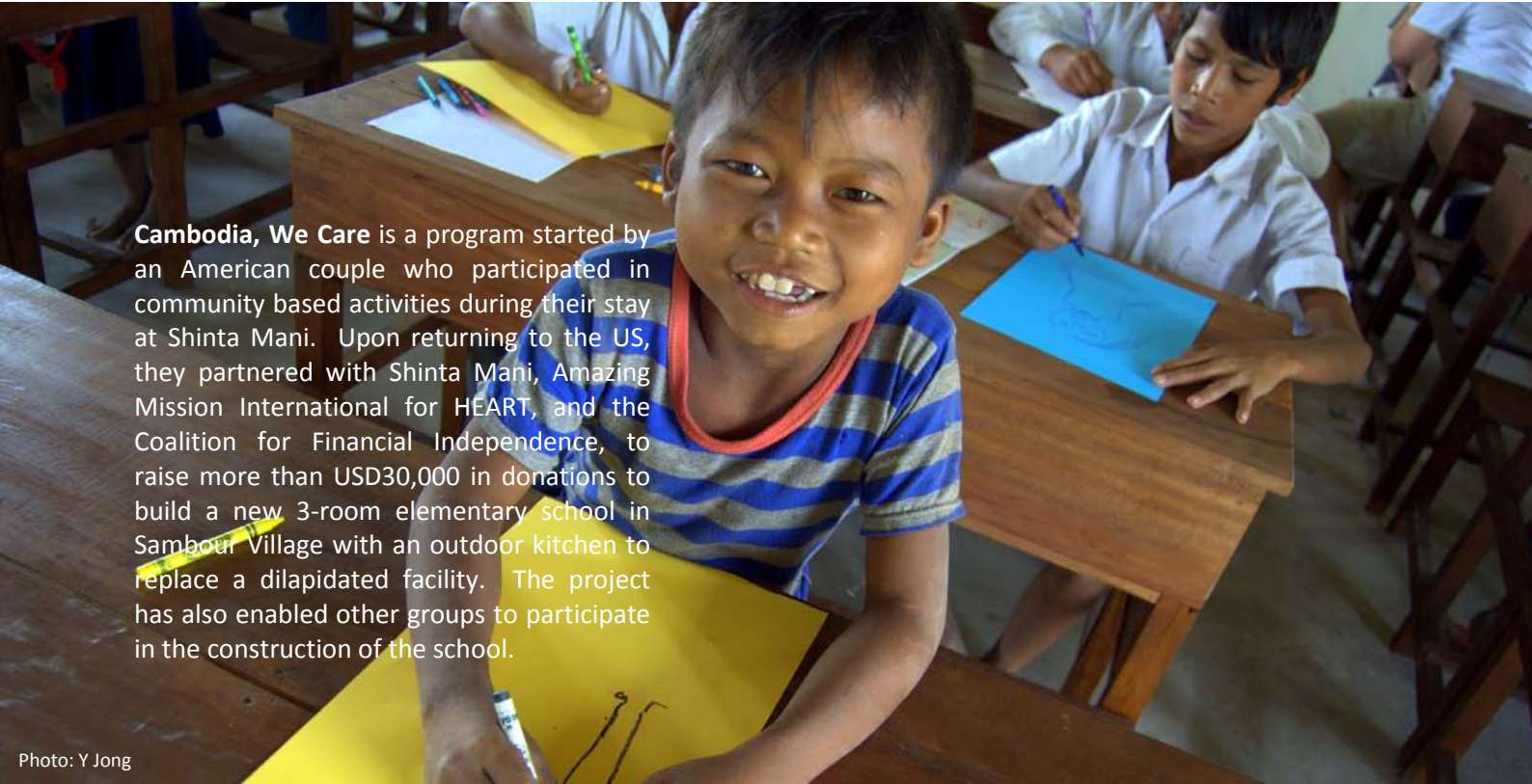
Shinta Mani heavily promotes community based activities that give hotel guests a unique opportunity to interact with local villagers. Community based activities promote sustainable tourism by enabling guests to visit villages where they can experience and understand the socioeconomic situations impacting communities in the destinations they visit. Such projects rely entirely on financial support from hotel guests and logistical assistance from Shinta Mani with surplus donations used to support the school.

The range of community development programs allows guests to choose their level of participation. For guests staying for short periods, the hotel facilitates a program whereby donations can be made for school supplies, bicycles, water pumps, or even school scholarships. Shinta Mani can also make special arrangements for guests wishing to participate in larger construction projects of schools or houses carried out with the help of partnering non-governmental organizations in Siem Reap. The programs currently attract 60 to 70% of all hotel guests, and positive feedback provides the hotel with reinforcement needed to expand its programs.

Examples of guest donations made between 2005 and 2009

Description Of Donation Item	Donation Amount	Donated (2005-2009)
Water well and hand pump that provides fresh water for a family	USD 100	1,027
Bicycle for a student who has to travel a long distance to attend school	USD 46	369
Pair of pigs that produce piglets and generate an annual income of ~USD 700	USD 80	120
50 kg sack of rice that can feed a family for one month	USD 50	15 tons
School uniform and supplies to help families that cannot afford them	USD 18	897
Sewing machine to assist those in the vocational sewing program	USD 85	182
Brick House for families that would need to save for 2 years to build a home	USD 1,250	89

While some donors have the opportunity to be introduced personally to their beneficiaries, the process of selecting suitable beneficiaries can often take some time. Although all donors receive a follow up letter and photographs of beneficiaries once a match is made, donations require a level of trust from donors that is supported by the credibility of Shinta Mani and its community based activities. The personalization of the donation program provides a unique experience guests remember and share with others. In many instances, they are further motivated to engage in additional community development activities once returning home.



Cambodia, We Care is a program started by an American couple who participated in community based activities during their stay at Shinta Mani. Upon returning to the US, they partnered with Shinta Mani, Amazing Mission International for HEART, and the Coalition for Financial Independence, to raise more than USD30,000 in donations to build a new 3-room elementary school in Sambour Village with an outdoor kitchen to replace a dilapidated facility. The project has also enabled other groups to participate in the construction of the school.

“The biggest success factor is that the entire team at Shinta Mani supports the work, fosters its growth, and lends the necessary skills when needed.”
Solomon DeLeon, Community Based Activities Coordinator

WHY IT WORKS

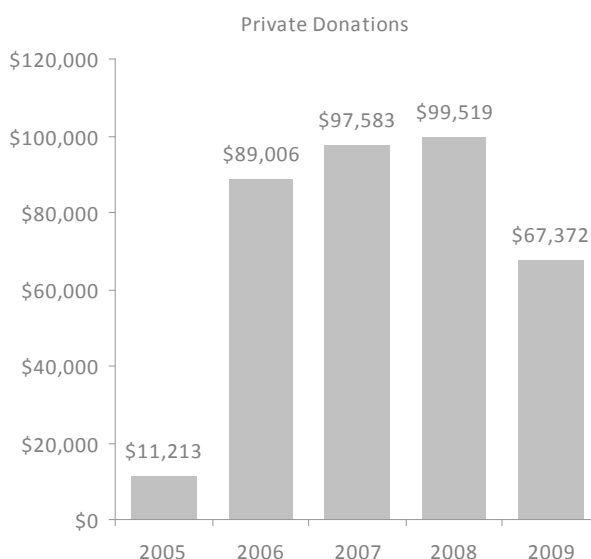
In developing nations that suffer from poverty, malnutrition, lack of education and access to basic facilities, sustainable tourism can be used as a means to improve infrastructure and the welfare of the community by bolstering the economy and creating jobs to minimise negative economic, environmental and social impacts. Programs are developed by members of the community-based activities program in collaboration with Shinta Mani management and community beneficiaries. Shinta Mani also has strategic partnerships with other organizations, hotels and tour operators that help organise additional community activities and provide additional marketing support. When required, other organizations are consulted for assistance.

Benefits for the Community

Improved Opportunities

Donations and active participation have raised more than USD 364,000 in direct community development aid to support more than 1,000 families in rural Siem Reap. Via the Development Centre, more than 160 students have been given the opportunity to gain vocational skills needed to acquire jobs to support themselves and their families. A recent donation in 2007 from a corporate sponsor in Singapore has enabled the Hospitality Institute to add a bakery program to its curriculum.

By providing basic necessities including water, food, shelter and education, rural communities are better equipped to be self-sufficient without the ongoing support of outside aid.



Challenges

While the goal of community based activities worldwide is to create self-sufficiency among rural participants, a common issue is their over reliance on foreign aid and donations, or the lack of ownership needed to ensure proper use and management of donations. To avoid mismanagement or exploitation of their program, Shinta Mani carefully chooses beneficiaries and provides additional training where necessary. Only those who show complete dedication and care are eligible for additional assistance. Programs are also frequently reviewed to assess their success and impact on the rural community, leading to the termination of certain programs failing to show positive impacts. While early programs focused on infrastructure, future projects will instead focus on education and teacher training to provide rural participants with skills to ensure personal sustainability.

Benefits for the Industry

Skilled Labour

Upon graduation, students are able to apply for a number of positions throughout the industry. Via the program, the industry has access to trained individuals for improving service standards in Cambodia.

Benefits for the Hotel

Revenue Generation

The hotel maintains product differentiation and a competitive advantage to attract guests who support community based activities. As awareness increases amongst travellers, they will likely choose hotels and destinations promoting responsible tourism. Varied activities promote a longer length of stay, create unique experiences and generate repeat visitation and word-of-mouth marketing.

Skilled Labour

The industry has access to trained individuals for improving service standards for hotels in Cambodia. Each year, Shinta Mani is able to hire approximately two to four students per year. In addition, the restaurant supervisor, head culinary instructor and storekeeper at the hotel are all students who were promoted from within once obtaining employment at Shinta Mani.

Benefits for the Guests

Understanding that all guests have different motivations during their stay, Shinta Mani does not pressure guests to participate in its programs. However, for those who are interested, the hotel can customise programs to suit different levels of interaction. In general, 60 to 70% of guests participate in community based activities during their stay.

Lasting Impressions and Sense of Purpose

Direct interaction and increased awareness enhance the sense of destination leaving stronger and longer lasting impressions on guests than simply visiting historical sites. Many guests express a sense of purpose and are often influenced to continue fund raising from home, or to seek other opportunities connected to sustainable tourism. Corporate groups also see the value of participating in community-based activities as a way to be socially responsible while building team morale.



“We are committed to seeing the brand develop as a regional/global entity, providing a benchmark platform of sustainable and responsible development.”

Shinta Mani

SHINTA MANI: BUSINESS CASE OVERVIEW

Key Takeaways

Tourism can be used to improve infrastructure and the welfare of local communities (reducing risks and creating a safer and more attractive tourism destination). Shinta Mani’s dedication improves the community where it operates, and provides guests with experiences generating customer loyalty and word-of-mouth marketing. Guest sponsorship has raised up to USD 364,000 in direct community aid to reduce poverty and develop micro-businesses to help Cambodia grow as a sustainable destination.

Revenue Generation and Customer Loyalty

With increased interest and access to developing nations, there is a growing trend for travellers to organise trips incorporating an element of community service. Hotels like Shinta Mani dedicated to responsible tourism and social causes will have the competitive advantage of having established credible and legitimate programs. At present, 60 to 70% of guests contribute funds or participate in the Community Based Activities, illustrating the impact responsible tourism has on the Shinta Mani business model.

What Doesn’t Work

Although the hotel is profitable and guest participation in community activities has increased, both are limited by the hotel’s small scale. An expansion is currently underway to increase the hotel’s room count to 39 rooms and include a larger education facility with dedicated classrooms, a proper cooking school and an audio visual centre for student and guest education. The expansion will enable the hotel to accommodate more guests, increase its revenues, and increase enrolment at the Development Centre.

Why They Do It?

This is first and foremost a value driven social enterprise model, driven by a deeply committed individual, which has generated significant local development impact, and has capitalised on growing interest from guests to support social and economic development in the locations they visit. The strong philanthropic model has underpinned the hotel’s impact and shows there is still considerable benefit to be derived from such activities. The challenge now is both to scale up such activities (which will occur to some extent through organic growth of the Shinta Mani), but also to get wider adoption from other operators who may not have a similar philanthropic commitment, but who can see that commercial benefits are derived via better staff retention, repeat business and other business benefits.

Acknowledgements:

Shinta Mani

Sokoun Lo Chanpreda, Shinta Mani, Owner

Douglas Loudon, Bed Management, Operations Director Hotel Division

Solomon DeLeon, Shinta Mani,

School Administrator & Community Based Activities Coordinator

Sources:

Shinta Mani (www.shintamani.com)

Cambodia We Care (www.cambodiawecare.org)

Amazing Mission International for Heart (www.AMI4heart.org)

Coalition for Financial Independence (www.cfi-asia.org)

SUMMARY

How clear is the business case for hotels to become more socially and environmentally sustainable and what factors are encouraging or discouraging this trend? The nine case studies making up this report identified a range of business drivers encouraging more sustainable practices (including concerns about climate change and water security), as well as impediments to wider uptake and impact (conflicting public policies, limited data collection and reporting, and limited engagement by the financial sector to support more sustainable practices). The sections below summarise key findings and provide recommendations and suggestions.

Findings

The Business Case is clearer but remains un-quantified in many cases

Some sustainability drivers are becoming clearer, and energy/ climate change, water use and security, and waste disposal are all areas of hotel operations where better performance is resulting in cost savings or other direct benefits. The payback times for technology improvements (the use of LED bulbs for example) and capital expenditure are often only a few years, and as energy and water costs seem likely to increase in the near term, the business case for more efficient use of water and energy, and better management of waste (including recycling and waste reduction activities) are self evident. Interesting examples of innovation and management practices in the InterContinental Bora Bora Resort & Thalasso Spa, The Oberoi Udaivilās, and Soneva Fushi case studies demonstrate how energy cost and climate change mitigation are now aligning to support the business case. Importantly these environmental benefits have been achieved at both new and refurbished hotels (though the challenges may be greater in refurbishments).

In other areas, the business case is less clear, however there appear to be emerging business benefits from landscape management maximising local biodiversity and reducing water use costs (see Wyndham Vacation Resorts Seven Mile Beach and Evason Phuket).

Consistent (though largely un-quantified) benefit is also apparent in social outreach and community development (especially at resort hotels - where a “social licence to operate” is consistently cited as being important), and also in a proactive labour and employment program (in terms of staff retention, productivity and innovation). Of course, many hotels in the region have derived similar benefits so we recognise the case studies do not represent the only operations testing different models of social outreach and employment practices.

Finally, evidence indicates proactive support of cultural and natural resources generates business benefits. Commitments shown by some case studies move beyond philanthropic donations to local cultural heritage sites, including working with local communities to protect and enhance assets, supporting small businesses servicing guest interests and helping to protect natural and cultural resources (for example local biodiversity conservation initiatives (see InterContinental Bora Bora Resort & Thalasso Spa, Soneva Fushi, Wyndham Vacation Resorts Seven Mile Beach).

Lack of hard data continues to be a problem

While most of the case studies in this report collect some information about environmental performance (especially energy and water use), this information is often inconsistent and in many instances appears not to be used strategically to inform business decision-making. Inconsistent use of key performance indicators across the sector, and lack of public reporting of performance, reduces the clarity of the business case. Certainly, in the absence of social and environmental data across all aspects of a hotel’s operations, it may be difficult to make strategic decisions about where to focus resources and effort.

Leadership and vision are important precursors to change

A strong message to emerge across all scales of operation is that leadership and commitment to more sustainable operations is necessary to effect meaningful change. Whether this is at the owner level (Six Senses Resorts & Spas, The Schoolhouse, Shinta Mani, Our Native Village, InterContinental Bora Bora Resort & Thalasso Spa) or operational level (Wyndham Vacation Resorts Seven Mile Beach, Crowne Plaza Melbourne).

Linked to the leadership and vision driving many initiatives, a strong and important role for philanthropy (from owners and guests) is evident, and philanthropy appears to be an important aspect of some sustainability activities represented in these cases (particularly the community / social outreach activities). While this is important and worthy, it is equally important to try to quantify the business benefits and to internalise the costs of such activities where the case is strong, otherwise there is unlikely to be widespread adoption and uptake outside of the operations in question.

Small may be beautiful, but the challenges of scale and replication remain very evident

Interesting models and initiatives have been developed by some of the smaller hotels forming these case studies, but equally there is a clear challenge in moving from bespoke small scale successes to large scale replication and uptake. Economies of scale and successful linkages to local Small and Medium Sized enterprises (including food production and service provision) important in driving sustainable local economies have proven difficult. (See Our Native Village, Shinta Mani, The Schoolhouse).

The financial sector isn't convinced yet

One of the intentions of the review was to understand whether financial institutions were recognising the business case for sustainability. Based on these case studies banks and investors appear not to be specifically considering environmental and social performance of hotels as a material or significant consideration. In contrast with other industry sectors (such as agribusiness, mining and textiles), environmental and social issues are regularly assessed in lending and investment decisions.

A role for public policy and regulation

The hotel sector (especially resort hotels) faces particular challenges in relation to cumulative impacts. Even if one hotel is exemplary in its efforts and impacts, if located in an area with many other hotels less sustainably inclined, the cumulative impacts still result in negative environmental and social impacts. Collective action to reduce cumulative impacts has proven difficult to mobilise in many cases (though operators in the cases reviewed have often made significant efforts to effect large scale change in practices in the locations they operate from). In the final event, public policy and land use planning are the only factors likely to address the cumulative impacts of hotels.

Sustainability as a driving force for change?

Sustainability is certainly a growing trend, however sustainable tourism as a concept doesn't appear to have made significant inroads amongst mass market travellers. Most hotels are unable to demonstrate a direct link between sustainability impacts and visitor demand, acknowledging sustainability still falls behind location, experience, product, price, security and numerous other decision making factors.

There are exceptions however - niche hotels completely localised and actively involving guests in community outreach programs are able to substantiate the impact social sustainability has on building a viable business model. For such products, discernible travellers seek experiences embodying community, cultural and social programs. (See Shinta Mani and The Schoolhouse).

Another reason sustainability isn't a main driving force appears to be the lack of available information and marketing. Few hotels successfully market Corporate Social Responsibility (CSR) efforts as a selling feature, and the lack of an established tourism resource or database of sustainable hotels limits their exposure to a wider audience of potentially interested consumers.

CONCLUSIONS & RECOMMENDATIONS

Based on the findings, we have made a series of recommendations:

Hotel Operators and Developers

- The case for proactive management of energy and water use, and waste management, is self-evident and a fundamental requirement of the business strategies of all hotels and developers. A “next generation” of issues and impacts relating to biodiversity and natural resources (including food and furniture) and social impacts (e.g. supply chain linkages to local economies) are the emerging new challenges for the sector. Further thought needs to be given to ways these new issues can be managed in the hotel sector in Asia;
- Cost savings and other benefits are apparent when energy, water and waste management are proactively addressed, but these efforts are often *ad hoc* and unrelated to wider business strategy or medium term planning. More consistent integration of environmental and social trends and issues is needed to change the way the sector as a whole responds to the challenges of the 21st century. The failure to more fully integrate sustainability drivers into business activities is very different from other industry sectors (e.g. agribusiness, electronics, manufacturing).
- More consistent monitoring of the costs and benefits of environmental and social performance, the consistent use of Key Performance Indicators and greater reporting of business impacts are essential. There are now a variety of hotel certification schemes, reporting initiatives and sources of advice (including the International Tourism Partnership¹) providing important and useful guidance.
- Brand standards encouraging or requiring incorporation of sustainability measures can facilitate widespread changes across the industry. However strict brand standards can also inhibit a hotel’s ability to employ innovative business practices that can be environmentally, socially and economically viable. Where opportunities exist, flexibility should be allowed in terms of design, localised purchasing, menu development, localised amenities, etc.

Public Policy Makers and Land-use Planners

- Several of the case studies in this review encountered significant difficulties in implementing energy and water efficiency measures (with clear business and financial benefits) because of public policy and legal restrictions that fail to address environmental and social externalities. Continuing failure to allocate and integrate these costs fairly is hindering business and creating significant longer-term development challenges for government, business and society². Public policy needs to re-consider how it can fairly and rapidly support sustainability efforts through incentives and regulation.
- The cumulative impacts of hotel development (including particularly water and land use) are difficult to address, but affect everyone. Land use planning and related public policies need to more effectively address this challenge – since it is very difficult for individual companies/assets to take action. Collaboration between the hotel sector, government and others is one way in which cumulative impacts can be addressed

Finance Sector

- The finance sector has been largely silent in promoting or supporting the business case for more sustainable hotels. In part, this may be because the financial case is not yet compelling (though it is clearly strong in relation to energy and water use). Given the resort hotel sector’s particular vulnerability to climate change (and the implications for insurance risk and pricing), it would seem appropriate for greater engagement from the finance sector.

¹ For example the work of the International Tourism Partnership <http://www.tourismpartnership.org/>

² See for example The Economics of Ecosystems and Biodiversity (TEEB) - a major international initiative to draw attention to the global economic benefits of biodiversity, to highlight the growing costs of biodiversity loss and ecosystem degradation, and to draw together expertise from the fields of science, economics and policy to enable practical actions moving forward. <http://www.teebweb.org/>

GLOSSARY

Biochar	Charcoal produced primarily for the use of carbon sequestration. Biochar buried underground can reduce green house gas emissions, improve soil nutrient content and agricultural productivity.
Biodegradable	Generally organic material (food, fibres) that is broken down by micro-organisms to constituent nutrients and elements.
Biodiesel	Fuel substitute produced from vegetable oil or animal fat for diesel engines.
Biodiversity	The degree of variation of life within a given ecosystem or location.
Biofuel	Alternative fuel source derived from renewable biomass products.
Biogas	Gas produced when natural materials such as vegetation and sewage decompose in an oxygen-free atmosphere. Captured biogas can be used as biofuel.
Biomass	Natural materials originated from living or recently living organisms which can be transformed into an energy source (wood, plants, alcohol fuels, etc.)
Biosequestration	See Carbon Sequestration
Bore well	Well that accesses the water table via use of a pipe and pump.
Building Management System (BMS)	Computerised system managing heating, lighting, air conditioning and security of a building to optimise resource use and reduce utility costs.
Cap & Trade System	System implemented to reduce carbon emissions by issuing carbon credits to companies producing emissions below a set cap which can then be traded or sold to companies that produce excess pollution.
Carbon Credit	Credit a company can trade in the cap & trade system to neutralise its carbon footprint. One carbon credit is equivalent to one metric ton of carbon dioxide or other greenhouse gases.
Carbon Footprint	Calculation of total greenhouse gas emissions caused by an organization, group or individual
Carbon Neutral	State where zero carbon emissions are released into the atmosphere from a specific activity. Only realistically achievable in most instances through a combination of emission reduction and carbon offsetting. Theoretically different from Carbon Zero, which refers to producing zero carbon in the first place. See Carbon Zero.
Carbon Offset	Practice whereby companies purchase carbon credits to offset the amount of greenhouse gas emissions they release into the atmosphere.

Carbon Sequestration	Removal of carbon from the atmosphere and securing them in carbon deposits (e.g. forests, or soil) as a method to mitigate global warming. Forest replanting and biochar are common methods.
Chlorofluorocarbon (CFC)	Range of hydrocarbons that deplete the atmospheric ozone layer. CFCs are typically found in refrigerants, solvents, etc. Though still commonly found in developing countries, international regulations are reducing availability and resulting in replacement with less damaging chemicals (including Hydrochlorofluorocarbons (HCFCs).
Compact Fluorescent Lighting (CFL)	Energy efficient and durable replacement for tubular fluorescent lamps. Their major shortcoming is the mercury content often responsible for landfill contamination and health issues when improperly disposed of.
Corporate Social Responsibility (CSR)	Ongoing commitment a company has to operate commercial or industrial activities in an ethical manner. CSR is the deliberate inclusion of public interest issues into corporate decision-making, and the commitment to a triple bottom line approach to business that seeks to address and maximise human development needs, sustainable use of natural resources and commercially viable operations.
Deforestation	Removal of trees from their natural habitat often for commercial reasons and without proper reforestation. Adverse impacts include biodiversity loss, and increased carbon emissions leading to global warming.
Desalination	Process of removing salt from water to create fresh water for human use. While suitable for island locations with limited fresh water supplies, desalination requires large amounts of energy and expensive infrastructure
Ecosystem	A combination of all the organisms living in a particular area, as well as all the nonliving, physical components of the environment with which the organisms interact, such as air, soil, water, and sunlight
Fair Trade	A market-based approach that aims to help producers in developing countries obtain better trading conditions and promote sustainability through a guaranteed price minimum for goods and services.
Global Warming	Increase in the earth's atmospheric temperature caused by increases in greenhouse gas emissions with resulting impacts on climate change.
Greenhouse Gases (GHG)	Gases trapping solar radiation in the atmosphere resulting in global warming. A range of gases contribute to global warming including carbon dioxide, nitrous oxide, methane and fluorinated gases.
Grey Water	Waste water from domestic activities that can be easily recycled for other purposes such as landscape irrigation and toilet flushing.
Hydrochlorofluorocarbon (HCFC)	Organic compound used in refrigerants, solvents, etc, up to 98% less ozone depleting than the chlorofluorocarbons (CFCs) they replaced in most developed nations. CFCs are still commonly found in developing countries.

Light-Emitting Diode (LED)	Lighting source rapidly replacing incandescent and CFL bulbs. The benefits include a long life span (up to 5 years), high energy efficiency, non-toxicity, durability, reliability and minimal requirements for maintenance.
Non-Governmental Organization (NGO)	Voluntary and non-profit group typically created to address issues such as community development, environmental protection or human rights.
Non-profit Organization	An organization which uses its surplus funds to pursue specific goals instead of distributing financial benefits to the owners or shareholders.
Organic Farming	Farming technique excluding use of synthetic fertilisers, chemicals, antibiotics and genetically modified organisms.
Organic Food	Foods produced with limited use of synthetic materials during production.
Photovoltaics (PV)	Generation of electricity from light using solar panels.
Rainwater Catchment	System capturing and storing rainfall then used for various purposes such as irrigation or domestic use.
Reforestation	Replanting of forests that have been removed or destroyed.
Reverse Osmosis (RO)	Process of filtering water through a membrane to create pure water.
Sea Water Air Conditioning (SWAC)	Cooling system that uses deep cold seawater to produce chilled air for air conditioning and refrigeration. While seawater is an inexhaustible and free natural resource, the system can be expensive to install.
Sustainability	Concept aiming to fulfil the present and future needs of mankind by reducing impacts on the environment and its natural resources.
Volatile Organic Compound (VOC)	Organic chemical elements from many cleaning, maintenance and building products which vaporise and affect the environment. Common man-made sources include paints, varnishes and chlorofluorocarbons.
Wastewater Treatment Plant (WWTP)	Facility reducing contaminants in waste water before being discharged back in the environment.
Wind Turbine	Windmill capable of generating energy.
Xeriscaping	Sustainable landscaping practice reducing or eliminating the load on stressed water supplies often needed through supplemental landscape irrigation. Also known as xerogardening.
Water table	Upper surface of groundwater below which soil is saturated with water.
Zero Carbon	Situation whereby no carbon is released into the atmosphere in the first place. Solar power is an example of a zero carbon form of energy. Theoretically different from carbon neutral, which relies on carbon offsetting and the cap & trade system to neutralise carbon emissions.

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