

Case Study

Sustainable Sacrifices, Tourism for a Better Tomorrow

Today's travelers are better informed about the environment and conscious about the footprints they leave behind. Sustainable tourism is an important part of travel. The aim is to have a positive experience that helps local communities without negatively affecting the environment.

Management at hotels have realized, increasingly, that a sustainable approach preserves the environment, avoids wastage of resources, and makes good longer-term business sense. However, there is a need to incorporate sustainable principles from the design stage itself. While easily understood, sustainability is difficult to put into practice due to various reasons. This case study looks at how the management of a Negombo beach-side hotel overcame barriers and embraced sustainability. An inspiring story to others who want to minimize their carbon footprint.

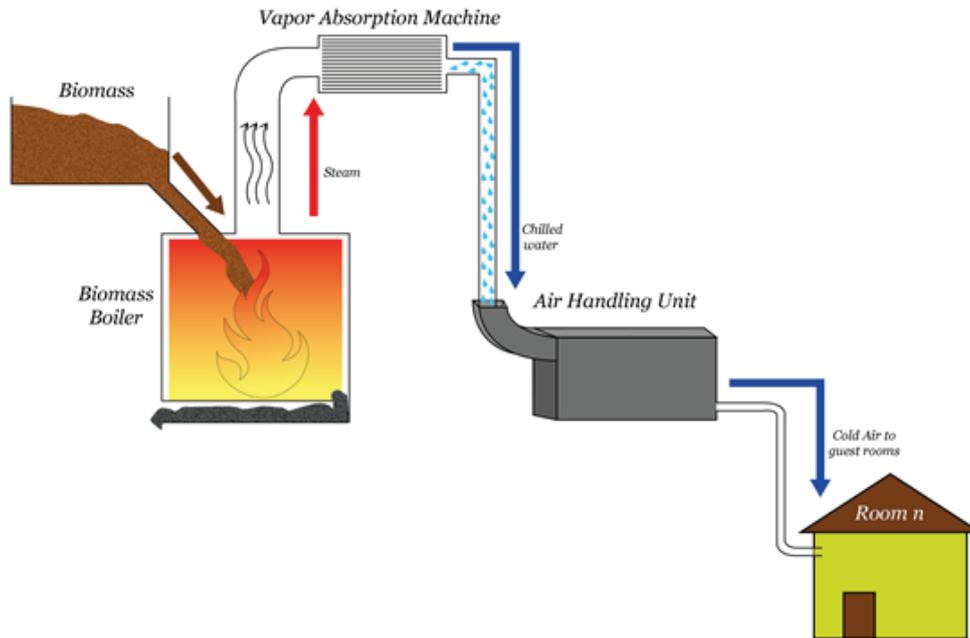
The hotel, located along the Negombo lagoon, has existed for almost 20 years. However, it had been neglected for a long time. With the influx of tourists and urgent need for more and better accommodation, this property was bought by a new owner who has rebuilt the hotel into a luxury spa resort with over 50 rooms and suites, restaurants, an iconic swimming pool and a host of other modern amenities. From an environmental point of view, the hotel seamlessly blends into the surrounding landscape

The hotel is owned by a group which owns a chain of hotels across Sri Lanka. A conscious approach to sustainability is an integral part of the group's ethos. Experience has shown that modern travelers look for and appreciate sustainable practices in the hotels they stay in. Besides, with high costs of conventional energy it made sense to go in for energy efficient technologies. The high capital costs would be more than made up in the long term. Some of the technologies implemented in the hotel's solar grid tie inverter system, the composting machine, and the salt water chlorinators are unique initiatives in the Sri Lankan context. Many initiatives have arisen from the group's experience in its other hotels.

Energy Conservation

Energy consumption has been minimized using various resource efficient methods. The hotel's management has often looked beyond short-term gains and embraced sustainability to the limit. This attitude helps the hotel maintain its image as one of the greenest hotels in Sri Lanka.

An air conditioning system was installed in the hotel, which runs on a vapor absorption machine that uses heat from steam. The steam is supplied by a biomass boiler, which has an average calorific value of around 3,000 kilocalories per kg. Current prices of biomass are \$0.10 per kilogram. Depending on how many hours it runs, the vapor absorption machine consumes about 40,000 kg of biomass per month. The hotel has a vapor compression based chiller plant of 120 tons of refrigeration as standby. While the vapor absorption machine consumes just seven kilowatt per hour, the standby vapor compression systems consumes 90 kilowatt per hour.



Vapor Absorption Machine Running on Biomass Boiler

Investments and Savings - Vapor Absorption Machine Running on Biomass Boiler

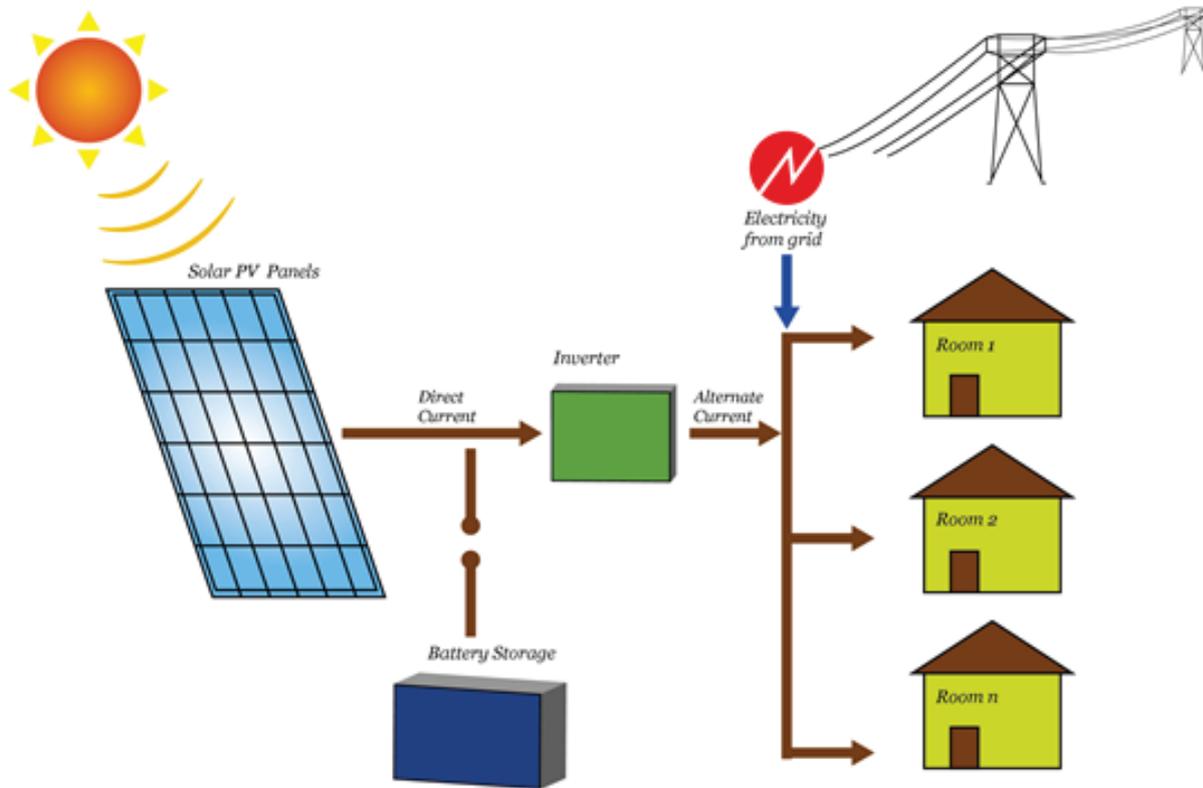
Investment involved	\$55,000
Annual electricity savings	518,000 kilowatt hours
Annual monetary savings	\$20,000
Estimated payback period	2.75 years
Annual CO ₂ reduction	326 tonnes

Electric geysers, previously used for hot water in guest rooms, have been replaced by solar powered water heaters, each having a capacity of 300 liters per day. The saving is around 54, 000 kilowatt hours of electricity per annum.

Investments and Savings - Solar Water Heaters

Investment involved	\$29,000
Annual electricity savings	54,000 kilowatt hours
Annual monetary savings	\$5,000
Estimated payback period	5.8 years
Annual CO ₂ reduction	34 tonnes

A Solar Photovoltaic (Solar PV) system was installed to generate electricity for guest room lighting. As a back-up during cloudy or rainy weather, the system is also connected to the regular power grid. The investment in this is quite high and will take 21 years to recover, but it stands as testament to the management's commitment to alternative energy.

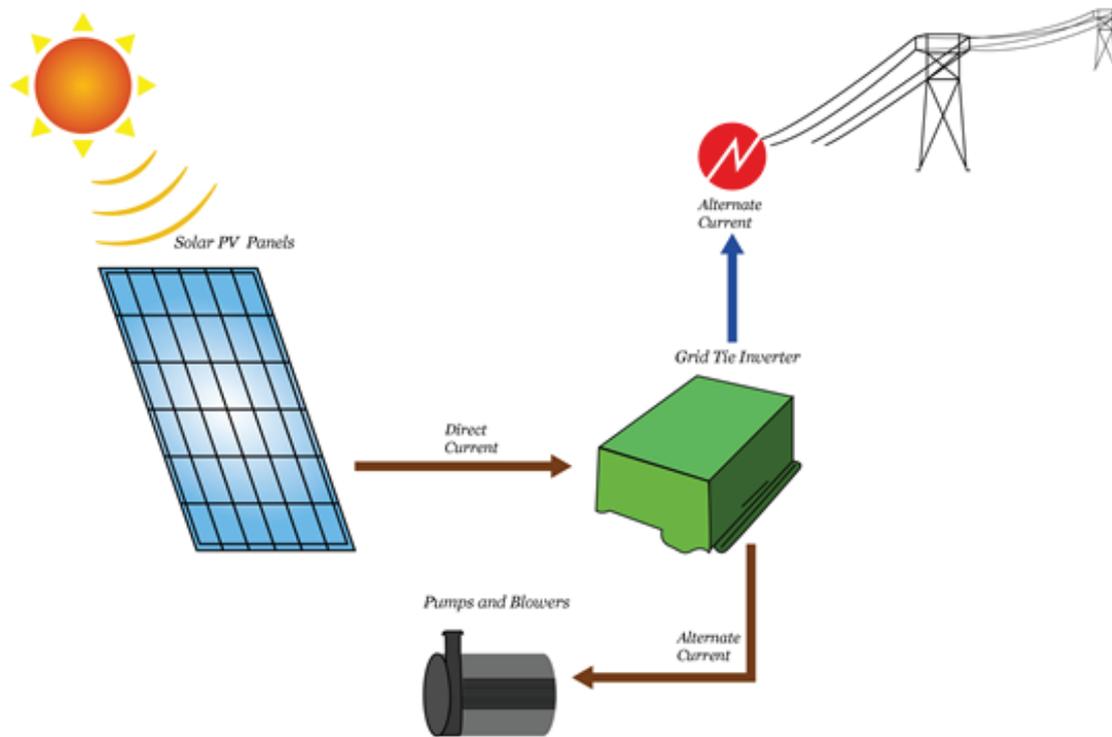


Solar PV system for Guest Room Lighting

Investments and Savings - Solar PV System for Lighting

Investment involved	\$63,000
Annual electricity savings	28,000 kilowatt hours
Annual monetary savings	\$3,000
Estimated payback period	21 years
Annual CO ₂ reduction	18 tonnes

Meanwhile, a 10 kilowatt solar grid tie inverter system was installed to convert solar energy into electricity for the boiler feed, water pumps, blower, and hot water circulation and distribution pumps. This inverter system is synchronized with the grid, and saves an estimated 16,000 kilowatt hours of electricity per year. This is a monetary saving of around \$2000 with an estimated payback period of 12 years.



Solar Grid-Tie Inverter

Investments and Savings - Solar-Grid Tie Inverter

Investment involved	\$24,000
Annual electricity savings	16,000 kilowatt hours
Annual monetary savings	\$2,000
Estimated payback period	12 years
Annual CO ₂ reduction	10 tonnes

As always, lighting in a hotel is a major area of energy consumption. To offset this, substantial investment in energy efficient lighting systems was made. Incandescent lamps have been replaced with around 2,500 light emitting diode lamps which has resulted in an annual reduction of electricity consumption of about 260,000 kilowatt hours to 36,000 kilowatt hours, saving the hotel \$22,000 per year. Here, the payback period is estimated at around two years.

Investment and Saving - Energy Efficient Lighting System

Annual electricity saving	224,000 kilowatt hours
Annual monetary saving	\$22,000
Annual CO ₂ reduction	141 tonnes

To reduce electricity consumption of pumps and blowers at reduced loads, variable frequency drives were installed. These are used for motors driving the chilled water pump, the condenser water pump, the fresh water pump, and the boiler blower.

Cumulative Investments and Savings - Variable Frequency Drives

Investment involved	\$10,000
Annual electricity savings	173,000 kilowatt hours
Annual monetary savings	\$20,000
Estimated payback period	0.5 years
Annual CO ₂ reduction	147 tonnes

The key card system, installed in every guest room, ensures all lights and electrical devices are turned off when the room is unoccupied.

Water Conservation

Conservation of water has been taken very seriously by the hotel's management, with numerous measures to reduce water consumption. From the installation of dual flush cisterns and low-flow taps and showers, water conservation has had significant impact, both environmentally and monetarily.

The installation of dual flushes has resulted in annual water saving of around 500 cubic meters, even at 60 percent occupancy levels. The monetary saving is around \$300 per annum. Meanwhile, annual monetary saving due to the use of low flow taps and showers is approximately \$1,600 or around 2,500 cubic meters of water.

Cumulative Investments and Savings - Dual Flushes & Low Flow Taps and Showers

Number of units installed	55 units each
Annual monetary savings	\$1,900
Annual water savings	3000 cubic meters

There is also a sub-metering system that helps monitor water consumption in different parts of the hotel. This helps to identify leaks and areas with potential to save more water. Meanwhile, wastewater is treated at a sewage treatment plant and is made suitable for reuse in the garden.

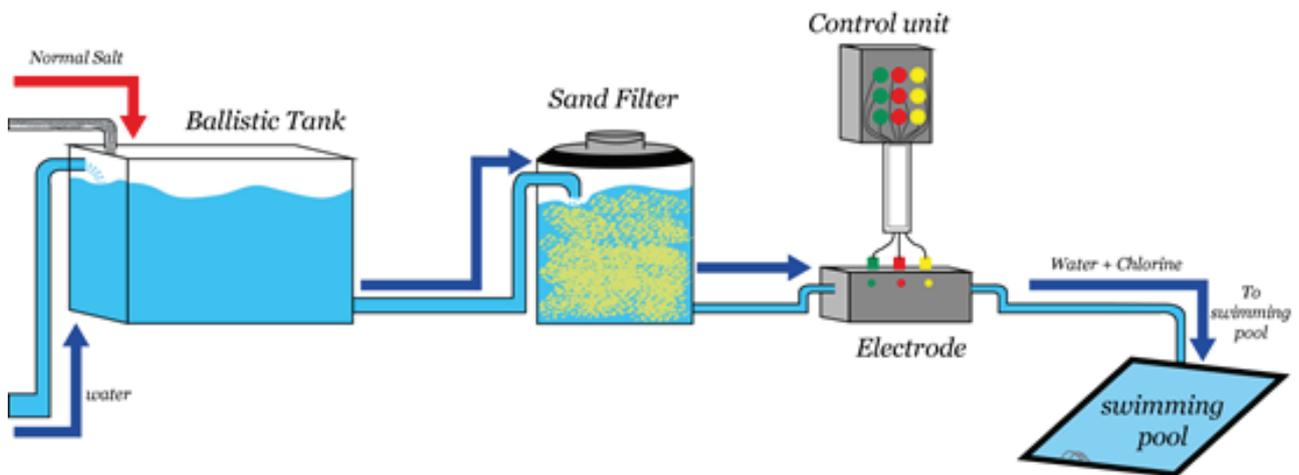
Waste Minimization

The efficient and responsible disposal of waste is a cause for concern for any hotel. The hotel's management has taken several steps to minimize and control waste through composting machines, chlorinators, and by sorting and segregating waste.

The onsite state-of-the-art composting machine reduces the average composting process to 14 days from the normal 40-day process. Around 95 percent of kitchen waste is processed through this machine, and the fertilizer generated is sold locally.

Plastic is used sparingly in the hotel and all rooms are 100 percent plastic free. The management discourages use of plastic straws or tissues to limit generation of non-biodegradable waste. All window blinds, stationary, and dispensers are made with biodegradable material.

The pool at the hotel is purified through a salt-water chlorinated system, as salt is not harmful to the environment like regular bleach. Additionally, salt water chlorinators require less maintenance, prevent skin irritation, and do not require a storage tank.



Salt Water Chlorinator

The management has adopted a sort and segregate program to collect paper, plastic, glass, and metals separately which are reused and recycled.

Lessons Learnt

The management has made every effort to instill a sustainability culture across its employee base. This has led to significant attitudinal changes in the staff. At the group level, a limiting factor is the unavailability of low cost funding for energy efficient technologies. Alternative energy solutions are extremely costly and subsidies would give a much needed boost for their widespread implementation.

In its first year of operations under new management, energy conservation initiatives at the hotel have resulted in approximate annual electricity saving of 1,000,000 kilowatt hours, water conservation of around 3,000 cubic meters, which is an annual CO₂ emission reduction of 677 tonnes. The resulting monetary saving is an estimated \$74,000. The energy and water savings at the hotel represents a saving of 26 and 16 percent respectively, when compared to previous levels of consumption. The annual electricity saving of the hotel is enough to meet the electricity needs of around 845 Sri Lankan households for an entire year.

This is the outcome of the journey that is shared by the management and employees. The management has proved that despite long term investment paybacks, its commitment to sustainability remains strong, its footprint on the environment remains small.

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