

# Procurement of energy efficient equipment to reduce carbon footprint in the Philippines

## Quick facts



Type of procurement:  
**energy-efficient equipment**



Year of inception: **2009**



Type of business: **Hotel**



Organisation name:  
**Daluyon Beach and Mountain Resort**



Number of staff: **55**



Country/region: **Palawan, Philippines**

## Background

Daluyon Beach and Mountain Resort is situated close to the Puerto Princesa Subterranean River National Park<sup>1</sup> – a UNESCO World Heritage Site. It is located in the south-western part of the Philippine Archipelago, on the mid-western coast of Palawan –360 km southwest of Manila. The Park not only features a spectacular limestone karst landscape with an underground river, but it also represents a significant habitat for biodiversity conservation. Protecting and conserving the natural values of the Park is therefore a critical concern when operating a resort in the vicinity of the UNESCO World Heritage Site.

## The challenge

**Reducing the environmental impacts of the resort operations by choosing energy-efficient solutions, and decreasing the dependency on fossil fuels without compromising on the guests' comfort and satisfaction** has driven the decisions of Daluyon Beach and Mountain Resort. However, reducing the energy and resource consumption and their associated costs while meeting the needs of a resort in a tropical climate requires identifying reliable alternative energy sources and robust green technologies.

## The strategy

In 2009, Daluyon Beach and Mountain Resort joined the EU-funded SWITCH-Asia Zero Carbon Resorts project<sup>2</sup> (2009-2014), whose objective is to enable tourism SMEs to procure energy services in an efficient, cost effective, and environmentally sound manner. The project accompanies hotels and resorts in their switch from fossil fuels to renewable energy sources in order to reduce emissions and secure the availability of energy services in urban, remote, environmentally sensitive areas.

In this context, Daluyon Beach and Mountain Resort developed alternatives to incorporate cost-effective, energy-efficient, and environmentally-friendly technologies in its daily operations (i.e., energy-efficient lighting and air-conditioning, environmentally friendly insulation materials etc.). The "3R" strategy is anchored throughout the process, i.e.:



**R (Reduce):** Reduce energy consumption;



**R (Replace):** Replace inefficient appliances and equipment;



**R (Redesign):** Redesign buildings into more self-sufficient and carbon-neutral structures.

More specifically, the following has been put in place:

<sup>1</sup> More information available at: <https://whc.unesco.org/en/list/652>

<sup>2</sup> More information available at: <https://www.switch-asia.eu/projects/zero-carbon-resorts/>

	Actions
<b>Reduce</b> energy consumption	Installation of tubular lighting, louver roof ventilation, water sprinklers on the roof, light sensors and energy monitoring equipment
<b>Replace</b> inefficient appliances and equipment	Replacement of conventional technologies to energy and environmentally sound equipment such as A/C inverter units, Smart LED televisions, and solar energy equipment for heating water.
<b>Redesign</b> Buildings into more self-sufficient and carbon-neutral structures.	Use of both active and passive cooling techniques through sustainable architecture and use of renewable energy, including: <ul style="list-style-type: none"> <li>- Combination of air-condition units and natural ventilation;</li> <li>- Use of solar power for LED lighting in guest rooms and beach bar;</li> <li>- Transition to a gas absorption chiller and heater technology;</li> <li>- Use of local and sustainable materials for the resort's main structures. For example, locally available cogongrass was used for rooftops and recycled wood for the panels and furniture.</li> </ul>

In 2017, follow-up activities of the Zero Carbon Resorts project included **capacity-building initiatives delivered by The Palawan Council for Sustainable Development to resort staff**, which aimed at sharing up-to-date information on available green technologies and products to increase energy efficiency in resort operations and guidance on how to conduct energy assessments.

## Impacts



- ➡ Prior to 2009, Daluyon Beach and Mountain Resort used a 110kVA Diesel Generator set for 16 rooms with restaurants and facilities, which was then downsized to 83kVA despite the expansion to 27 rooms thanks to the use of gas cooling and heating technology.
- ➡ Initially, Daluyon Beach and Mountain Resort had a single air conditioning system of 2hp power non-inverter type, demanding on average 1866 W. This system was then replaced with two more efficient inverter units (which can modulate compressor speed according to the load): one of 1.5hp with an average power demand of 840 W and another 1hp with 640 W. **These two units allowed savings of between 55% and 65% of monthly electric costs.**
- ➡ The installation of tubular lighting enabled a decrease in temperature in the kitchen, as fluorescent lights generate less heat during the daytime. It allowed **monthly energy cost savings of 24 USD per tubular light.**
- ➡ **Installing louver roof ventilation** on the roofs of guest rooms and staff houses, as well as **water sprinklers** on the roof of the pavilion tent which helped reduce radiant heat generated an **annual energy savings of 4,200 USD.**
- ➡ **100% solar-powered LED lighting in the guest rooms and beach bar allowed annual savings of 400 USD per lamp.**
- ➡ The transition to a gas absorption chiller and heater technology enabled between **46% and 60% savings in operating costs** as opposed to a traditional electric air-conditioning system.



Daluyon Beach and Mountain Resort was recognized as one of the recipients of the 2012-2014 ASEAN Green Hotel Award<sup>3</sup> and also received in 2018 the ASEAN Sustainable Tourism Award<sup>4</sup>.

<sup>3</sup> More information available at: <https://nezeh.com/asean-green-hotels/>

<sup>4</sup> More information available at: <http://aseantourism.travel/content/asta>

*"We keep on upgrading and re-inventing in a greener way, as there are new green technologies we can choose from. Being a responsible businessman and simultaneously caring for the environment is good business sense."*

– Ruben F. Tan, Jr., Chairman and Chief Executive Officer, Daluyon Beach and Mountain Resort



Louver ventilation installed on the roof of a guest room



The newly installed water sprinkler at the roof of the tent.



## Lessons learned

- ✓ Strong engagement of the resort owner was critical to support the sustainable development of the resort and consider green alternatives as a long-term investment rather than a cost;
- ✓ Having skilled maintenance engineers on site is certainly a success factor; offering them regular capacity building opportunities in order to keep abreast of the latest green technologies proved to be critical.

For further information



<http://daluyonbeachandmountainresort.com/press>



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