

Peek Project Description

The overall aim of the “Program for Energy Efficiency in Kho Khao and Khao Lak (PEEK)” is to significantly reduce green house gas emissions from the hotel industry in Kho Khao and Khao Lak by means of innovative and replicable solutions for energy efficiency and renewable energy. PEEK is part of further efforts of UNWTO along with the Ministry of Tourism and Sports (MoTS) to create a model destination for sustainable tourism in Kho Khao and Khao Lak. The core work streams of the project are: Stakeholder engagement and information dissemination, Energy efficiency measures, Renewable energy technologies and Feasibility study for decentralized energy supply of the island.

Kho Khao Island Beach Resort /Hot Water System & Insulation

1. Hotel Description

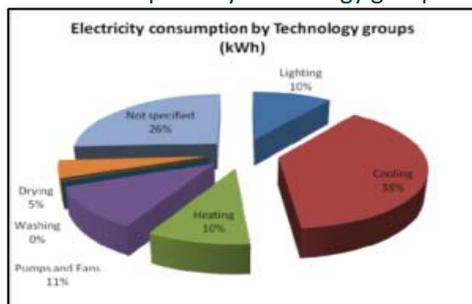
The Kho Khao Island Beach Resort and Spa (KIB) is a well-equipped 4 star holiday resort, with 75 rooms/villas in different categories. Regarding occupancy, during November and April, the occupation varies between 40 and 80 %, with higher occupancy during December-February.



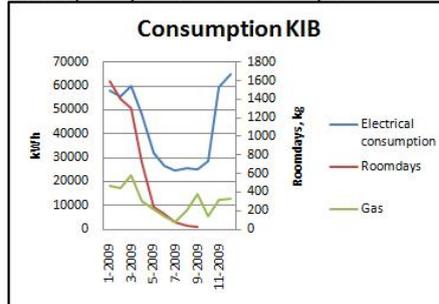
2. Energy Consumption

The detailed energy audits performed in spring 2009, provided the following results:

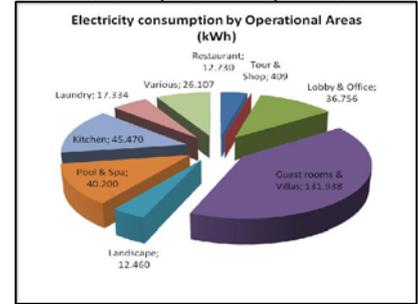
Elec. consumption by technology groups



Occupancy vs elec. consumption



Elec. consumption vs. ops. areas



The KIB hotel had an annual electricity consumption between 325,000 and 415,000 kWh. The main energy consumer was the A/C, responsible for more than 60% of the electricity consumption in the guest rooms and over one third of the elec. consumption of the whole resort.

3. CO2 and electrical savings

The Bungalows roofs were equipped with new insulation, for reducing the heat exchange (less use of A/C). A hot water system was installed, consisting of 4 A/C heat exchangers combined with 1 heat pump as back up attached to a water storage tank. Moreover, no- and low cost measures such as efficient lighting have been introduced.

All Energy efficiency measures implemented are stated in Table 1.

Monitoring: The expected CO2 & energy reduction of the Heat Recovery System was calculated assuming the use of typical electrical boilers instead of the heat recovery units (business as usual), by estimating guest behavior regarding hot water use. Regardless of the previous data, confirmation of the heat recovery unit power capacity was measured (Performance Testing). The insulation was monitored by measuring the decrease and impact in operating hours of the A/C in a room without insulation and in an insulated Bungalow. The insulated room needed 15% less time for reaching a desired temperature. EE no-low cost measures had been introduced and checked.

Table 1.

Energy saving measures	Annual kWh saving	CO2 reduction (ton/year)	Annual cost saving (Baht)
Insulation	15,908	8.04	57,268
Heat Pump and heat recovery System	23,088	11.67	83,117
No/low cost measures	21,099	10.67	75,956
Total	60,095	30.4	216,341