

## 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.

## C&N Kho Khao Beach Resort /Heat Recovery Systems & Mini Hybrid System (Wind & PV)

### 1. Hotel Description

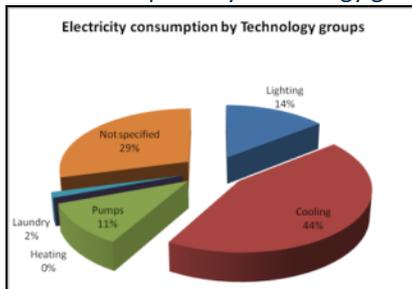
The C&N Kho Khao Beach Resort is a small, family-owned resort. It features 14 bungalow apartments located in seven twin-buildings, a pool and an open lobby and restaurant area with a small kitchen. Additionally, there is a small open bar on the beach. Regarding occupancy, due to its family-ownership and small-scale operations, the hotel has no occupation between May and October. During November and April, the occupation varies between 40 and 90 %.



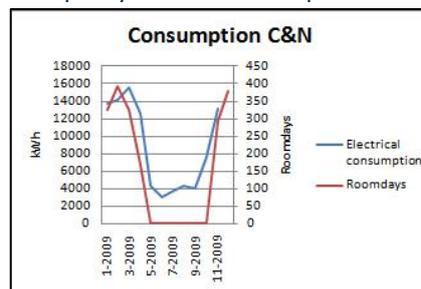
### 2. Energy Consumption

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

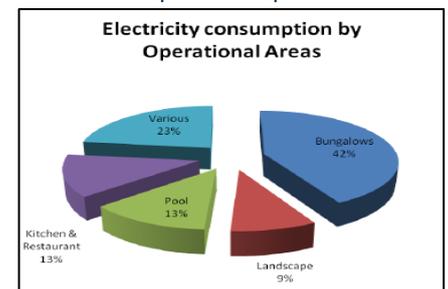
Elec. consumption by technology groups



Occupancy vs elec. consumption



Elec. consumption vs. ops. areas



C&N had an annual electricity consumption of 108,000 kWh. The largest share of the electricity was used in the bungalows with A/C being the largest consumer.

### 3. CO2 and electrical savings

Four new Bungalows were equipped with new heat recovery systems from A/C for hot water heating. A PV-wind-hybrid system was installed consisting of: 3 solar modules of 173 Watt Peak (Wp) and 1 Southwest air breeze wind turbine 200 Wp. 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 Heat Recovery System was installed in the 4 newly built bungalows. The expected CO2 & energy reduction 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. Confirmation of the heat recovery unit power capacity was measured (Performance Testing). The Hybrid system was monitored by directly measuring the energy output of the PV panels and Wind Turbine or data from the display. 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)
Wind + PV System	880	0.4	3,168
Heat Recovery	2,373	1.2	8,542
No/low cost measures	7,415	3.75	26,694
Total	10,668	5.35	38,404