



CASE STUDY

ENERGY AUDITING FOR ESTABLISHING A HOLISTIC ENERGY EFFICIENCY IMPROVEMENT PROGRAM AT THE SAUJANA HOTEL

ESTABLISHED ENERGY PERFORMANCE INDICATORS

TOTAL ELECTRICITY CONSUMED PER UNIT AREA	226.61 kWh/m ² /y
TOTAL ELECTRICITY CONSUMED PER GUEST ROOM	26,419 kWh/room/y
TOTAL ENERGY (ELECTRICITY & FUEL) CONSUMED PER UNIT AREA	1.47 GJ/m ² /y

INTRODUCTION

INFOLLIANCE was engaged to assess the energy consumption pattern of the **SAUJANA HOTEL** for implementation of potential energy cost reduction measures. An on-site energy audit was undertaken during the month of July 2005 to September 2005. The audit works includes an assessment of present utility consumption pattern and cost as well as recommendation of measures for implementation.

THE SAUJANA HOTEL

THE SAUJANA is a 386 rooms and suites resort hotel with a floor space of 45,000²m situated in Subang, Selangor managed by the **GHM Hotel Group**. It is accredited with a five star grading having different types of guest rooms, restaurants, a health studio, banquet halls, an entertainment center, and swimming pool.

TARGET IMPROVED ENERGY PERFORMANCE INDICATORS

TOTAL ELECTRICITY CONSUMED PER UNIT AREA	188.1 kWh/m ² /y
TOTAL ELECTRICITY CONSUMED PER GUEST ROOM	21,927 kWh/room/y
TOTAL ENERGY (ELECTRICITY & FUEL) CONSUMED PER UNIT AREA	1.19 GJ/m ² /y

PROGRAM OBJECTIVE

“ To *enhance* the current facilities for efficient use of energy and *establish a sustainable energy management system* for continuous improvement ”

The owners and management of the hotel have been committed to achieving best practices in energy conservation. Its prime aim is to qualify itself as a **GREEN HOTEL**.

THE ENERGY AUDIT APPROACH

The energy audit activities carried out by **INFOLLIANCE** at the hotel is targeted for electricity, fuel (natural gas), water and operation and maintenance savings. The air-conditioning system and steam boiler were the main energy consumers taking up approximately 65% and 6% respectively of the total energy use. Activities of the energy audit were focused at quantifying the following:

- ▶ Chiller capacity requirement & efficiency
- ▶ Chiller operating temperature profile vs. loading
- ▶ Pump capacity requirement & efficiency
- ▶ Pump operating head & flow vs. energy consumption
- ▶ AHU performance & operating efficiency
- ▶ End-use comfort level requirement & qualification of existing condition
- ▶ Overall chilled water plant effectiveness
- ▶ Steam boiler capacity requirement & steam supply and end use system efficiency
- ▶ Domestic hot water generation using alternative methods for energy economics

The program was initiated in May 2005 and the savings measures are expected to be completed in 2008.

HIGHLIGHTS

SUMMARY OF PROJECT IDENTIFIED

Retrofitting and refurbishment of chilled water plant, steam and hot water system

TOTAL ENERGY COST SAVINGS
RM 565,000 p.a. (USD 149K p.a.)

PERCENTAGE COST SAVINGS : 19 %

PROJECT COST

RM 2.6 million (USD 684,000)

INTERNAL RATE OF RETURN (IRR)
14.1 % (over 10 yrs at 8% discount)

PROGRAM FINANCING

The entire program is self funded by the client — SAUJANA