

Energy-Saving Interventions in Hotels & Integrated Resorts

by Nikos Tourlis *, April 2005

One of the main factors reducing the operating costs of hotels and integrated resorts is energy saving. The tourism sector has indeed an intense rate of energy consumption due to the standards of comfort and luxury imposed by the high degree competition in the respective sector. The most important hotel facilities and operations in respect to energy consumption are HVAC systems, the domestic hot water use, lighting and cookeries.

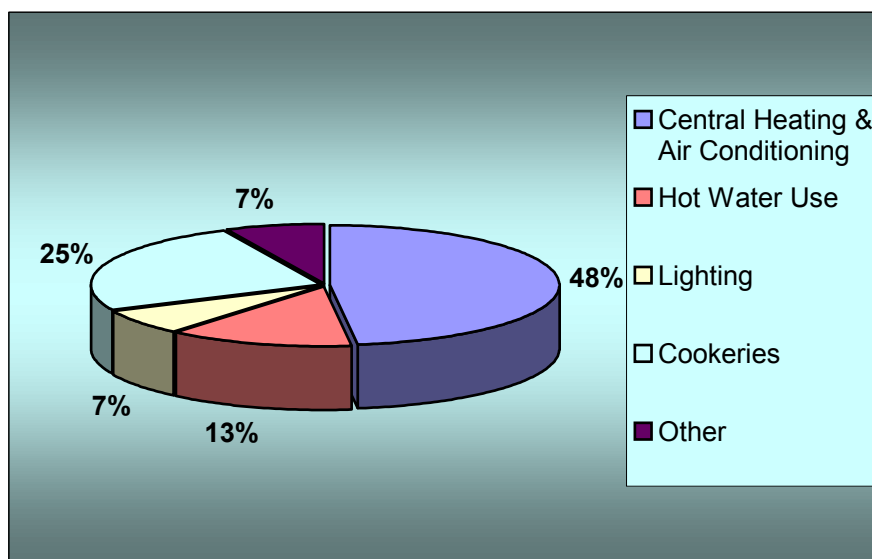


Figure 1: Energy consumption distribution for a standard hotel unit
(Source: International Energy Agency CADEET)

The estimated percentage of energy saving in the above sectors can range up to even 50%, if specialized studies and particular solutions are applied in each case. Still though, since this procedure is time-consuming and demands specific investment, general principles can be applied independently of the hotel's specific-based characteristics. Such principles include:

Lighting

Energy-saving interventions can reduce energy consumption in respect to lighting installations to a ration of 30%. Main measures in this sector are:

- substitution of glow lamps with fluorescent ones or with electronic low-consumption lamps
- substitution of older fluorescent lamps with more efficient ones
- maximum utilization of natural light
- use of dimmers for the adjustment of indoor illumination levels in cases of abundance of natural light



- use of key cards for light (and / or air conditioning) control

Integrated energy-saving systems can reduce energy consumption up to 50%, utilizing additional measures such as movement sensors, timers and indoor and outdoor light sensors.

Heating – Hot water use

Heating and water heating amount a significant ration in the total energy consumption of a hotel, depending on its classification and level of services. Energy-saving interventions in this sector include:

- regular boiler efficiency control
- hot water temperature adjustment to low acceptable levels
- room thermostat utilization and heating independence for the heating of only serviceable areas and spaces (resulting up to 20% energy saving)
- isolation of non-serviceable network sectors
- replacement of oil by natural gas and feasible use of cogeneration systems
- insulation of hot water storage tanks pipes and installation of bathtub water supply limiters (resulting up to 20% energy saving)

One of the most effective measures regarding hot water use energy saving is the installation of solar systems. Using electricity resistor for heating up water is the ultimate solution, since it results in high energy consumption.

Ventilation (cooling)

Ventilation in hotel units operates usually with integrated systems consuming electricity. Energy-saving interventions in this sector include:

- ventilation use limitation in non-serviceable areas
- coolant medium temperature adjustment towards highest acceptable levels (resulting up to 30% energy consumption reduction)
- nighttime ambient air utilization for building pre-cooling (free-cooling mode)
- installation of variant speed control systems in pump motors and ventilators
- shutdown of ventilator systems during non-use periods
- heat recovery from ventilation units

In particular, medium- and large-size hotels utilizing natural gas, if available, may apply absorption cooling systems (by using natural gas boilers) combined with cogeneration systems.

In addition to the above mentioned techniques, new commercial building energy management systems (BEMS) offer energy saving rates of up to 20%. By the application of BEMS, mainly suitable for large tourist facilities, the operator has a variety of choices regarding the monitoring, recording and control of energy consumption. Indicative BEMS advantages include:



- peak energy demand control
- time scheduled commands
- duty cycle control and output adjustment for controlled equipment
- optimised start and halt times for building facilities
- data collection and real time response

Energy saving proves to be an imperative policy for any contemporary tourist enterprise. Such a policy, defined on a case-by-case basis, can be designed and materialized in consultation with specialized companies and experts, in order to achieve result efficiency. The existing funding opportunities provided by the state in conjunction to the accumulated experience of the Greek engineering firms in designing and implementing energy efficiency programmes comprise a paved way to the tourism sector entrepreneurs in order to develop and sustain high-quality services at an affordable energy cost.

** Mr Nikos Tourlis is Energy Engineer at LDK Consultants*