Energy Management of Hospitals & Energy Conservation Award

CAHOCON 2017

April 15th, 2017

Hospital Sector: Size and Benchmarks

Alliance for an Energy Efficient Economy

Approx**. 1.1 million beds (0.9 bed per 1,000** in 2014**;**
Approx**. 50,000 beds** in the next 5-6 years;
Approx. **10% energy use** of commercial buildings

Private sector's share in hospitals and hospital beds is approx. 75% and 40%

Energy intensity benchmarks for Indian hospital:

200 – 300 kWh/m2 or 10,000-20,000/bed (Pvt hospitals: Multi-Speciality)

50 – 150 kWh/m2 or 15-15000/bed (Govt hospitals: Urban & Rural)

(Sources: Govt and industry publications)

WHAT'S IT WORTH? WHY BOTHER?

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Energy Costs in a typical private hospital

Annual Expense: 300 kWh/m2 or 20,000 kWh/bed

Monthly Expense: ₹16/sq. ft. or ₹12,000/bed

Energy Costs for a BEE 5-Star rated hospital

Monthly Expense: ₹8/sq. ft. or ₹4,500/bed

More than 50% energy and cost saving potential

Benchmarks For Rating EE Hospitals

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ENERGY PERFORMANCE INDEX

Energy Consumed normalised by built up area

ENERGY PERFORMANCE PER BED

Energy Consumed normalised by number of beds

ENERGY MANAGEMENT OF HOSPITAL EQUIPMENT

Procurement and O&M Guidelines for hospital medical equipment (approx 50% energy use)

CAHO Energy Conservation Award Analysis

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ENERGY PERFORMANCE INDEX

Varies from 180-390 (large) and 170-285 (medium)

ENERGY PERFORMANCE PER BED

Varies from 21,000 to 30,000 (large) and 10,000 to 25,000 (medium)

ENERGY MANAGEMENT OF HOSPITAL EQUIPMENT

Procurement and O&M Guidelines almost non-existent for hospital medical equipment – Big Opportunity

Energy Efficient Operation of Medical Equipment

Energy Consumption Pattern of MRI in Different Operating Modes

A state of art MRI scanner costs in the range of INR 3.5 to 12 Cr and the average monthly operational expenditure is in the range of INR 1.5 to 2 Lakhs

Mode	Average Power Use (kW)	Average distribution of daily energy use %
Low Power (Cannot be turned Off)	9.3	34
Ready to scan	14.6	34
Scan	22.3	32

Opportunity to save Rs. 50,000/month with proper training of technician and OEM-specified setting

Source: Source: Miscellaneous Energy Loads in Buildings by Sameer Kwatra, Jennifer Amann, and Harvey Sachs June 2013
COCIR Self-regulatory Initiative for Medical Imaging Equipment Status Report 2013

Energy UsePattern of a CT SCANNER

Mode	Average Power Consumption (kW)	Average distribution of daily energy Use %
Off	0	-
Low Power	1.2	25%
Ready to Scan	10.8	62%
Scan	12	13%

Opportunity to save Rs. 25,000/month with proper training of technician and OEM-specified setting

Source: COCIR Self-regulatory Initiative for Medical Imaging Equipment Status Report 2013

Recommendations for Energy Efficient Operation of Medical Equipment

- Monitor the energy use of medical equipment using a separate feeder
- Train staff on the use of low-power features, benefits and energy savings
- Switch the system off or activate low-power modes during off hours, when system is not in use, considering possible clinical limitations
- Regulate the room air-conditioning system when the machine is in off mode

Source: COCIR Self-regulatory Initiative for Medical Imaging Equipment Status Report 2013