Factsheet

Energy Efficiency for Hotel Industry

Sector Highlights

Tourism industy is recognized as one of the key economic pillars of Nepal. Hotel is the basic and main infrastructure of the tourism industry. According to Ministry of Finance 2015, a total number of 1,075 hotels are providing 36,179 beds for hospitality (MOF,2015). The hotel industry is considered to have the highest local private sector investment in Nepal and one of the highest contributors of foreign exchange reserves. The gross ouput of the Hotel sector together with restaurants is 108,942 million NPR in 2013/2014 (CBS,2015).

Energy Use

Hotel Industry in Nepal use both electrical and thermal energy. Main sources of the energy in the hotels are grid-electricity, diesel and liquefied petroleum gas (LPG). Refrigeration, air conditioning, lifting & lighting, steam/hot water generation and cooking are the major energy consuming areas in hotels. Among different sources of energy, electricity has the highest share about 60 % followed by Diesel (25 %) and LPG (12 %).

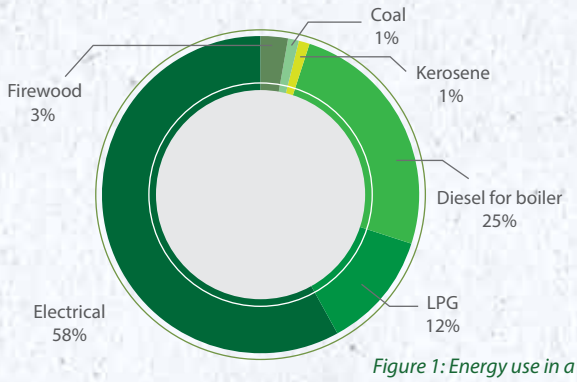


Figure 1: Energy use in a typical star-rated hotel in Nepal (GIZ/NEEP, 2012) [1]

The energy cost on product value is 8% for the hotels. The total efficiency margin or simply saving potential for thermal is estimated to be 39%, whereas 56% for electrical and 16% for thermal.

Nepal Hotels by numbers

1075 hotels in operation*
36179 beds for service*
NRs 100 billion investment*
US$ 330 million revenue*
8% - energy cost

*Status census 2011/12, update not available

Specific Energy Consumption	Electrical (Wt. Ave)	Thermal (wt. Ave)
Hotel sector Nepal	17,326 kWh	45,367 MJ

Table 1: Specific energy consumption of surveyed hotels in Nepal (GIZ/NEEP, 2012)

Experiences from the past have identified many options for improving energy efficiency in the hotel sector that are highly profitable with the payback period of less than 5 years.

Option	Payback of investment
Electrical Demand Management	Immediate
Avoiding non-critical loads during power failures	Immediate
Resetting Chilled Water Temperature to 10 OC	Immediate
Installing Damper in DG Exhaust	2 month
Regulating Chilled Water flow in old system	3 month
Heat Recovery from DG Exhaust	4 month
Installing VFD in hot water Circulating Pump	6 month
Power Factor Improvement from 0.90 to 0.98	1 year
Installing reversing cycle Chiller for 5th Floor Rooms	1-2 years
Installing LED lamps at select locations	1-2 years
Heat Recovery from Hot Water Heater Exhaust	1-2 years
Installing Solar Water Heater	1-2 years
Installing Digital Thermostats in Rooms	3 years
Installing Building Management System with adequate Metering	3 years
Installing Ice Bank System	4 years
Applying Sun Film coatings on South facing Windows	4-5 years

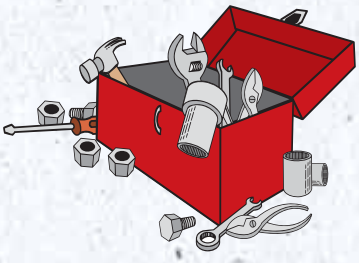
Table 2: Typical Energy saving option and payback period of investment for hotel sector (EEC/NEEP, 2015[2]*)*

[1] GIZ/NEEP, 2012: Baseline study of selected sector industries.

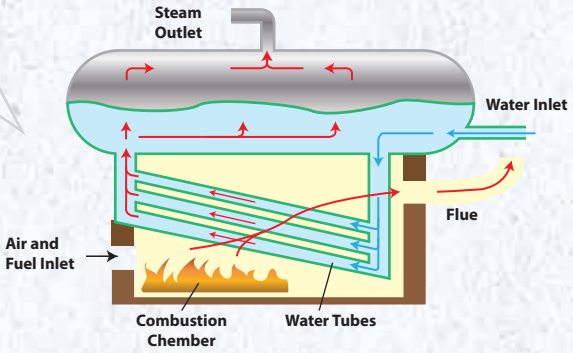
[2] EEC/NEEP, 2015: Pre-market assessment of audited industries.

Energy saving tips

Housekeeping
- Installation of Occupancy Sensor
- Installation of Biogas Plant
- Improvement of fuel storage and handling system

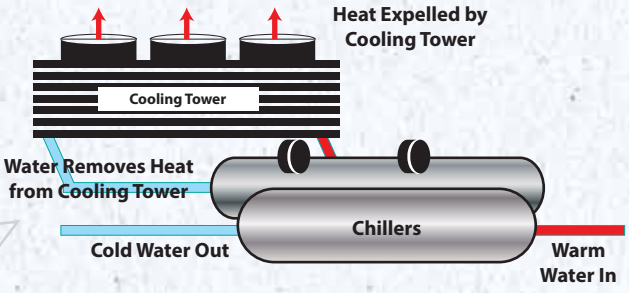


Boiler and hot water system
- Application of Combustion Gas Analyzer for combustion analysis and combustion tuning of boilers or hot air generators.
- Installation/maintenance of Steam Traps
- Optimization of Steam Distribution System (Steam Traps, Piping, Headers)
- Insulation of Flanges and Valves with Insulation Jackets
- Fuel Switching
- Replacement of Traditional Boilers with Fluidized Bed Boiler
- Installation of economizer for Waste Heat Recovery
- Installation of Air Pre-Heater (APH) for Boiler
- Installation of Auto Blow Down System in boiler



Electrical System
- Optimization of capacitor banks for maintaining the Power Factor at optimum level
- Replacement of Old (Rewind) motors with EE motors
- Adoption of the Load Management System
- Installation of Variable Frequency Drive (VFD) wherever applicable.
- Load Optimization of Drive Systems (Shuffling of Drive System)
- Optimization of Water Pump system
- Optimization of Lighting System voltage
- Replace traditional Fluorescent light with LED lights

HVAC and compressed air system
- Replace the Central-air conditioning system with Split Air Condition System
- Replacement of Traditional Chiller with EE Chillers
- Improvement of compressed air system performance



Case Study

Energy Audit that was conducted by EEC under NEEP, recorded specific energy consumption of 79 kWh/room/day in one of the hotels with total occupancy of 36,208 room days. The industry was able to reduce its specific energy consumption to 65 kWh/Room/day after improving the house keeping measures. Only investing NPR 150,000, the industry was able to make a saving of NPR worth 6.5 million.

During Energy Audit (SEC):	79 kWh/Room/day
After Implementation (SEC):	65 kWh/Room/day
Savings Per room day:	14 kWh
Total Occupancy:	36,208Room days
Annual Savings made :	506,912 kWh
Monetary Savings made:	Rs. 6,589,856 (@ 13/kWh)
Total Investment made:	150,000 (for housekeeping improvement)

Table 3: A success case from NEEP (EEC/NEEP, 2015)

Contact details

If you are interested to know more about energy efficiency, please, do not hesitate to contact us!

- If you are a business man
get information about energy saving opportunities in your company and get an energy audit done by our professional expert team
- If you are an engineer
explore the articles in our energy efficiency knowledge website and participate in our training programs
- If you are a banker...
participate in our awareness raising seminars and explore the new market of energy efficiency investment.
- If you are an energy auditor...
register in our database of energy efficiency professionals and be listed on our webpage.
- If you are a supplier for energy-efficient technology
register in our online B2B portal and list your products and services.

eec energy efficiency centre

FNCCI

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