Khwaja Moinuddin Chishti Urdu, Arabi- Farsi University

Lucknow, U.P.

Energy Audit Report

2018 - 2019

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AUDITED BY

Prof. S. H. Ali

Prof. S. S. A. Ashrafi

ई० आशुतोष कुमार श्रीवास्तव
मण्डल अभियंता
पूर्वोत्तर रेलवे बरेली

Independent Auditor ***Er. Ashutosh Kumar Srivastava***

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Energy Audit

1. Energy Audit

Energy plays a crucial role as a primary factor driving economic development in every nation. The overarching objective of energy management is to efficiently produce goods and services while minimizing costs and mitigating environmental impacts. Essentially, energy management involves the strategic optimization of energy usage through systematic processes and procedures, aimed at reducing energy consumption per unit of output while maintaining or decreasing overall production costs. Central to this approach is the implementation of energy audits, which provide a structured framework for decision-making by analyzing and balancing all energy inputs and outputs within a facility. Currently, the Government of India has set a comprehensive goal of achieving Net Zero emissions, requiring concerted efforts and meticulous planning.

1.1 Energy Audit Objective

"Energy Audit Objective The main energy audit objective is to reduce power consumption and save revenue of university. The objective of audit is to maximize saving energy and using best technology to save energy.

I. Primary Objective:

- Acquire and analyze data to understand consumption patterns across the university campus.
- Calculate energy wastage based on the findings from the initial data analysis.
- Implement feasible and cost-effective solutions to optimize energy usage and reduce wastage.

II. Secondary Objectives:

- Provide the university with valuable experience in energy management, serving as an initial exposure to this field.
- Enable the university to identify energy distribution patterns within its infrastructure.
- Foster technical and managerial skills necessary for future energy projects and initiatives.
- Contribute to ongoing follow-up projects, enhancing the university's overall technical and management exposure.
- Facilitate significant reductions in energy consumption, thereby contributing to the university's sustainability goals and overall achievements.

1.2 Benefits of Energy Audit

A. **Cost Savings:** i. Reducing utility bills and operating expenses through improved energy efficiency. ii. Maximizing return on investment by implementing cost-effective energy-saving measures.
B. **Environmental Impact:** i. Decreasing greenhouse gas emissions and environmental footprint. ii. Demonstrating our commitment to sustainability and corporate social responsibility.
C. **Enhanced Comfort and Productivity:** i. Creating a more comfortable and productive learning and working environment for students, faculty, and staff. ii. Improving occupant satisfaction and overall campus experience.

1.3 Methodology

The Energy Audit encompassed a comprehensive assessment of energy consumption across various university facilities, including academic buildings, administrative offices, laboratories, and residential

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quarters. Data collection involved examination of utility bills, on-site inspections, equipment evaluations, and interviews with stakeholders.

1.4 Findings:

a) Electricity Consumption:

- Analysis revealed a steady increase in electricity consumption over the fiscal year, primarily attributed to inefficient equipment and operational practices.
- Peak consumption periods were identified, indicating opportunities for demand-side management and load optimization strategies.

b) HVAC Systems:

- Heating, Ventilation, and Air Conditioning (HVAC) systems accounted for a significant portion of energy usage, with inefficiencies noted in temperature control and ventilation.
- Insulation deficiencies and outdated equipment contributed to energy losses and decreased system efficiency.

c) Lighting:

- Lighting systems were found to be outdated, with conventional lighting fixtures prevalent in many areas.
- Substantial energy savings could be achieved through the adoption of energy-efficient LED lighting technologies and implementation of occupancy sensors.

d) Building Envelope:

- Thermal leaks and inadequate insulation were observed in several buildings, leading to increased heating and cooling loads.
- Retrofitting measures and building envelope improvements were recommended to enhance energy efficiency and occupant comfort.

Yearly Consumption of Electricity of KMCUAFU

Month	Consumption Unit
January	47950
February	50650
March	38500
April	44250
May	71600
June	106350
July	96750
August	32450
September	51216
October	4392

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Month	Consumption Unit
November	118268
December	
Total	**662376**

1.5 Recommendations:

a) Energy-Efficient Equipment:

- Prioritize the procurement of Energy Star-rated appliances and equipment to replace outdated models.
- Implement a phased approach to upgrade HVAC systems with modern, energy-efficient alternatives.

b) Behavioral Changes:

- Establish energy conservation guidelines and awareness campaigns to promote responsible energy usage among students, faculty, and staff.
- Encourage the adoption of energy-saving practices, such as turning off lights and unplugging electronic devices when not in use.

c) Renewable Energy Integration:

- Explore opportunities for on-site renewable energy generation, such as solar photovoltaic (PV) systems, to offset electricity consumption and reduce reliance on the grid.

d) Building Retrofits:

- Undertake retrofitting projects to improve building envelope performance, including insulation upgrades, window replacements, and sealing of air leaks.

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