CASE STUDY

ENHANCING ENERGY EFFICIENCY AND COMFORT

A SMART ENERGY MANAGEMENT TRANSFORMATION IN HOSPITALITY SECTOR

Company profile:

The client is an upscale five-star hotel located in Mumbai, strategically positioned near the International Airport and key city areas. Renowned for its leadership in the hospitality industry, the hotel boasts 150 well-appointed rooms, each designed to provide an exceptional level of comfort and luxury. The property features a sophisticated restaurant offering a diverse range of culinary delights, as well as three versatile meeting venues, making it an ideal destination for both leisure and business travelers. In terms of infrastructure, the hotel is equipped with world-class amenities and services. The hotel operates round the clock, with an annual average electricity energy expenditure of approximately **~ $2,53,000 USD.**

Case Summary

The client sought to implement a future-ready energy management solution with the primary objective of optimizing temperature control and streamlining HVAC operations through remote monitoring. The goal was to reduce energy consumption, lower operational costs, and enhance overall efficiency while minimizing carbon emissions—all without compromising guest comfort and essential operational parameters. Furthermore, the facility aimed to strengthen its commitment to sustainability through improved energy efficiency.

Prior to the implementation of our solution, the hotel faced rising energy expenses and operational inefficiencies that hampered its sustainability efforts. The client also required the solution to be deployed during non-peak hours to avoid disruptions to daily operations and ensure that guest comfort was maintained at all times.

To address these challenges, we implemented an IoT-based Smart Energy Management Solution, enabling centralized automation, real-time energy tracking, and remote HVAC monitoring. The solution optimized energy use, reduced costs, and supported the hotel's sustainability goals, all while ensuring minimal disruption of facility's daily operations.

Business Challenges

The client faced significant operational challenges impacting energy efficiency and cost-effectiveness.

To overcome these challenges, the client required an automated, high-efficiency energy management system capable of real-time monitoring, intelligent decision-making, and optimized energy consumption, ensuring cost savings and enhanced sustainability. Our team conducted a thorough energy audit and detailed energy accounting to ensure optimal performance and maximize energy savings.

Challenges Faced:

- Aging HVAC Infrastructure: Inefficient equipment resulted in excessive energy consumption.
- Limited Building Management System (BMS): The absence of real-time monitoring restricted effective control over Air Handling Units (AHUs) and chillers.
- High Energy Costs: Inefficient energy usage and lack of optimization led to escalated operational expenses.
- Manual Energy Management: Dependence on manual interventions for HVAC operations resulted in inconsistencies and inefficiencies.

Our Solution

To address the limitation clients existing system we developed and deployed an IoT-based, VFD driven Smart Energy Management Solution, which integrates energy efficient equipment with AI/ML driven analytics, remote operating capabilities enabling data driven decision making.

This integrated solution enhanced operational efficiency, reduced energy costs, and improved occupant comfort, positioning the facility for long-term sustainability.

Installing and commissioning HVAC systems at the hotel presented unique challenges due to high occupancy rates and the need to work during non-peak hours. Our IoT-based BMS suite, known for its rapid implementation and retrofit-friendly design, proved essential in optimizing HVAC operations. Our team demonstrated exceptional execution excellence by meticulously planning shutdowns during non-peak hours to minimize disruption, retrofitting the entire infrastructure with zero downtime.

Key feature included:

- Dynamic Chilled Water Balancing (DCWB): Optimized chilled water flow using VFD Control, enhancing energy efficiency based on real-time demand.
- Smart VFD Control for HVAC: Automated temperature regulation through wireless sensors, reducing energy wastage and ensuring efficient air distribution.
- Chiller Plant Manager (CPM): Comprehensive automation for chillers, pumps, and cooling towers, enabling real-time monitoring and remote management.
- Analytical Dashboard: AI-powered analytics for centralized energy monitoring, occupancy trends, heatmaps, and automated reporting, streamlining decision-making.
- Indoor Air Quality Management (IAQM): Deployment of HyperStats for continuous monitoring of air quality, temperature, humidity, CO2, VOC, Lux level, sound, and occupancy ensuring a healthier indoor environment.

Key Business Impact

Energy Savings: Achieved a reduction of **~200 thousands units** within 12 months of commissioning with avg monthly energy saving of **~17%.**

Cost Reduction: Optimized energy consumption, leading to **~ $22,970 USD** cost savings on electricity.

~5 to 10% improvement in operational efficiency, reducing manual intervention in monitoring and reporting.

Enhanced building management through real-time insights and automated control systems.

Enhanced Sustainability: Supported the facility's eligibility for green building certification and improved environmental performance.

Reduction in carbon emissions by an impressive **~150 tones** supporting Net-Zero strategies.

Improved Air Quality: Better IAQ management contributed to a healthier indoor environment for patients and staff.

~80% Improvement in asset inspection accuracy and inspection coverage.

Success Recap

By integrating advanced automation, real-time monitoring, and AI-driven analytics, the hospital has optimized its HVAC operations while ensuring a comfortable and healthy environment for guest and staff. This initiative not only aligns with the hotel's sustainability goals but also sets a benchmark for future-ready energy management in the hospitality sector.

We introduced a highly flexible and financially viable business model, leveraging a shared savings approach with zero upfront investment required from the client. The seamless execution of the project, combined with our strategic financial model, earned substantial trust and commendation from the client. . As a result, we were the obvious choice to undertake the next facility of their hospitality chain for implementation of the solution.