Case Study

Transforming Healthcare Energy Management

A Smart & Sustainable Approach

Company Profile

The client is a leading multi-specialty healthcare institution located in Mumbai. The hospital is committed to delivering world-class medical services operates with a capacity of 300+ beds equipped with state-of-the-art medical infrastructure, including 24/7accident and emergency centre. Beyond its core medical services, the hospital features a range of essential amenities, including a cafeteria, family lounge, auditorium, ATM services, general stores, gymnasiums, and pharmacies. Operating round the clock, with annual average electricity energy expenditure of approximately **~ $6,93,390 USD** .

Case Summary

The client, a renowned multi-specialty healthcare facility in Mumbai, aimed to implement a future-ready energy management solution to optimize energy consumption, reduce operational costs, and enhance overall efficiency while minimizing carbon emissions—without compromising patient comfort and critical operational parameters. Additionally, the institution sought to improve energy efficiency and achieve eligibility for green building certifications.
However, the facility faced significant challenges, including aging HVAC infrastructure and the absence of a fully functional Building Management System (BMS), which restricted real-time monitoring and control. To address these challenges, we deployed an advanced IoT-based Smart Energy Management Solution. This initiative facilitated centralized automation, real-time energy tracking, automated utility control, and data-driven decision-making, enabling the facility to enhance efficiency, optimize costs, and achieve sustainability goals.

Business Challenges

The client faced significant operational challenges impacting energy efficiency and cost-effectiveness, including:

- 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.

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 Solution

To address these challenges, we developed and deployed an IoT-based Smart Energy Management Solution was deployed, integrating advanced automation, real-time monitoring, and data-driven controls. Key features 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 heatmaps, and automated reporting, streamlining decision-making.
- Indoor Air Quality Management (IAQM): Deployment of HyperStats for continuous air quality monitoring, ensuring a healthier indoor environment.

This integrated solution enhanced operational efficiency, reduced energy costs, and improved occupant comfort, positioning the facility for long-term sustainability. Given the critical nature of the medical facility operating 24/7, ensuring uninterrupted operations Our team demonstrated exceptional execution excellence by successfully retrofitting the entire hospital infrastructure with zero downtime.

Key Business Impact

Energy Savings: Achieved a reduction of **~550 thousands units** within 12 months of commissioning with avg monthly energy saving of **~17%.**

Cost Reduction: Optimized energy consumption, leading to **~ $75,551.18 USD** cost savings on electricity.

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

Prevents downtime by predicting equipment failures and enabling timely maintenance.

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

Environmental & Social Impact

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

Reduction in carbon emissions by an impressive **~450 tones** supporting Net-Zero strategies.

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

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 patients and staff. This initiative not only aligns with the hospital's sustainability goals but also sets a benchmark for future-ready energy management in the healthcare 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 phase of the transformation—retrofitting an additional set of Air Handling Units (AHUs) integrated with IoT-based automation.

The client has expressed a keen interest in meeting their energy requirements through efficient and customized solutions. As a result, our proposal for an integrated renewable energy supply, including Green Power and e-Mobility, is currently under discussion with client.