Chapter 11
Intelligent Energy Information and Management System for Academic Institutes

Maneesha, Praveen Kant Pandey and Sachin Kumar

Abstract Requirement of energy for human sustenance and growth has increased exponentially during the last century. The rate of rise in demand for energy has reached unprecedented levels leading to widening of gap between demand and supply of electric energy due to the scarcity of resources. The harmful effects of excessive usage of energy on the environment pose a great danger to the sustainability of our ecosystem. In this scenario, it becomes pertinent to design a strategy for increased efficiency of electricity utilization with an aim to minimize air pollution and carbon footprint. Hence, energy management systems are the need of the hour to identify the potential for improvements in energy efficiency. However, the implementation of Energy Information and Management System (EIMS) in academic institutes is extremely limited due to lack of awareness and relevant green policies. The current work presents a blueprint of Energy Information and Management System for an academic institute leading to multi-measure energy efficiency through multiple strategies including equipment operational improvements and upgrades, and occupant behavioural changes. The design of Intelligent EIMS enables energy savings relative to a baseline model, which predicts energy consumption from key parameters such as occupancy levels mapped with the timetable and operational schedule. The need for policies to be adopted by educational institutes for optimum utilization of electrical energy has been discussed and presented in the paper. In the present work, the different sub-domains/facilities of the college were primarily divided into three categories, namely facilities mapped with college timetable (like classrooms, laboratories, etc.), facilities mapped with fixed or regular schedule (like hostel mess, corridors, etc.) and facilities independent of college timetable or fixed schedule (like canteen, staffroom, common room, etc.). The two basic categories were further subdivided on the basis of scheduled usage and ad hoc usage of these facilities. Based on these categorizations, policies for energy usage were framed for these facilities, and prototype EIMS was designed and implemented at Maharaja Agrasen College,

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