Analysis of electricity consumption pattern in Sri Lankan apparel industries

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Energy is the appropriate thermodynamic potential for a given pathway. In recent days the world energy has emerged as great importance due its scarcity. Because of the gradual depletion of natural resources of energy, the importance of energy saving is now being realized on world wide scale; hence many individuals and organizations have now identified the potential need for doing research on energy consumption. Many industrialized countries are claiming that a considerable amount of their energy is consumed by industrial sector. Because energy is required for production, services, heating, lighting, ventilation, internal transport and cleaning etc. Therefore, energy consumption by equipments used in industrial sector becomes as a significant issue. Electricity is one of the core energy in equipping the industrial sector. As far as apparel sector is concerned, apparel factories utilize electricity from national grid, furnace oil and Diesel. Electricity from national grid consumes more than 60% of total energy and 33 % of the total energy cost. Therefore, it is important to study the energy consumption pattern in apparel sector which in turn will lead to energy efficiency, resulted in reduction of energy cost. This study has aimed to carry out an analysis of electricity consumption pattern in apparel industry in terms of equipments & functional areas and to recommend relevant energy serving measures. Initially, walk through audits for more than twenty factories were conducted in order to identify the electrical equipments used and to study their performance. Based on these audits, detail audit was carried out in selected high potential apparel factories to study the potential use and to asses the electricity consumption by the equipments & each functional area occupied. Finally, cost benefit analysis of energy serving measures was carried out. This will help to formulate an organizational strategy for saving and improving energy efficiency. From this study, the average maximum demand and actual consumption of electricity was analyzed, by which wastage of energy was estimated. The result revealed that more than 25% of the energy is wasted due to inefficient use of electricity. When electrical energy is discriminated by equipment wise the major electrical energy user was air-conditioners, which records 51% of the total energy consumed while Lighting, Sewing Machines, Pumps and Fans, Computers & other equipments consume 26%,12%,5%,4% & 2% respectively. On the other hand, analysis of functional area reveals that, the major portion of electrical energy is used for Sewing area, which is 72%, while Offices, Cutting and other areas consume 19%, 6% and & 3% respectively. It was further found that there is a potential of serving energy in Air conditioning, and by improving the power factor, System generation and Lighting.